

DIV. OF FISHES

COMMERCIAL FISHERIES REVIEW

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Vol. 20 , No. 10

OCTOBER 1958

FISH and WILDLIFE SERVICE
United States Department of the Interior
Washington, D.C.



COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries
prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor
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Mailed free to members of the fishery and allied industries. Address correspondence and requests to the: Chief, Branch of Market News, Bureau of Commercial Fisheries, U. S. Department of the Interior, Washington 25, D. C.

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The printing of this publication has been approved by the Director of the Bureau of the Budget, May 21, 1957. 5/31/60

CONTENTS

COVER: The new docksite for the research vessels of the U. S. Bureau of Commercial Fisheries Pacific Oceanic Fishery Investigations and the Hawaiian Board of Agriculture and Forestry at Kewalo Basin, Hawaii (see pp. 35-36 of this issue).

	Page		Page
A New Method of Handling Long-Line Gear Using a Rotating Tub, by Herbert J. Mann.	1	TRENDS AND DEVELOPMENTS (Contd.)	
RESEARCH IN SERVICE LABORATORIES:	8	North Atlantic Fisheries and Gear Research:	
Technical Note No. 46 - Method for Removing Blood		Safety Program and Gear Research Studies (M/V	
from Halibut to Improve Appearance of Frozen Steaks,		(M/V Delaware Cruise 58-4)	30
by David T. Miyauchi, and Richard W. Nelson	9	North Atlantic Fisheries Investigations:	
Studies on the Relationship of Fish Oils to Circulatory		Vertical Distribution of Post-Larval Ocean Perch	
Diseases Initiated.	12	in Gulf of Maine Studied (M/V Albatross III	
TRENDS AND DEVELOPMENTS:	13	Cruise 116)	31
Alaska:		North Pacific Exploratory Fishery Program:	
Silvers Return Home to Ketchikan Hatchery	13	Exploratory Fishing for Shrimp off Alaskan Coast	
Southeastern Lake Systems Rehabilitated for Use in		(M/V John N. Cobb Cruise 39).	32
Salmon Rearing	13	Oysters:	
California:		Joint Research Program on Standards	34
Pelagic Fish Distribution and Abundance off Southern		Pacific Oceanic Fishery Investigations:	
California Surveyed (Airplane Spotting Flight 58-8) . .	14	Albacore Tuna Survey in Central North Pacific	
Aerial Scouting Continued to Study Pelagic Fish Popu-		Completed (M/V Hugh M. Smith Cruise 46)	34
lations and Census of Commercial and Sport Fishing .	14	New Docksite Facility Opened	35
Channel Catfish Spawning Experiments Successful . .	18	Sport Fishing:	
Dungeness-Crab Distribution, Abundance, and Size Stud-		Program for Improving Sport Fishing	36
ies Continued (M/V N. B. Scofield Cruise 58-5-3-Crab).	18	Swordfish:	
Yellowfin Tuna and Skipjack Tagged Along Baja Cali-		Evidence that Broadbill May Be Wide-Ranging	37
fornia Coast (M/V Independence Cruise 58-C-1-Tuna)	19	Tuna:	
New Type Fish Screen Proves Successful	19	Tag Returns Reveal Migration of Albacore in Pacific	
Tag Returns Show Increase in Striped Bass Fishing . .	20	U. S. Foreign Trade:	
Cans--Shipments for Fishery Products January-June 1958	20	Groundfish Fillet Imports, August 1958.	38
Croakers:		Edible Fishery Products, May 1958	38
Croaker Tagging Program in Chesapeake Bay	20	Imports of Canned Tuna in Brine Under Quota	39
Federal Purchases of Fishery Products:		Imports and Exports of Selected Fishery Products,	
Department of Defense Purchases, January-July 1958.	21	January-June 1958	39
Great Lakes:		Virginia:	
More Michigan Streams to be Chemically Treated to		Crab Kills Caused by Lack of Oxygen	39
Destroy Sea Lamprey Larvae	22	Washington:	
Great Lakes Fishery Investigations:		Salmon Fish Farming Shows Promise	40
Survey of Western Lake Erie Fish Populations Con-		Wholesale Prices, August 1958	41
tinued by M/V Cisco	22	FOREIGN:	43
Western Lake Superior Herring and General Fishery		International:	
Survey Continued by M/V Siacowet	24	World Exports of Fish and Fish-Liver Oils Lower	
Irradiation Research in Foods	25	In 1957	43
Louisiana:		Food and Agriculture Organization:	
Shrimp Regulations Revised Effective July 1, 1958 . .	27	More Fishery Officers for Latin America	43
Maine Sardines:		International Pacific Halibut Commission:	
New-Style Canned Packs Exhibited at Fair.	28	Area 3A Closed August 31	43
Massachusetts:		Territorial Waters:	
July-August 1958 Boston Landings Lowest in 36 Years.	28	Resolution of Western European Fishery Conference	
National Fish Week:		Condems Icelandic Unilateral Extension of Fish-	
Fish Promotion Campaign Aided by Interior Department.	29	ing Limits	44
Fishing Industry Promotes Fish and Seafood Week . .	29		
Fish Week Supported by White House	30		

COMMERCIAL FISHERIES REVIEW

October 1958

Washington 25, D.C.

Vol. 20, No. 10

A NEW METHOD OF HANDLING LONG-LINE GEAR USING A ROTATING TUB

By Herbert J. Mann*

CONTENTS

	Page		Page
Introduction	1	Operation of the Gear:	6
Recent innovations	2	Setting operation	7
Construction of the tub	5	Hauling	7
The setting trough	6	Discussion:	7
The long-line hauler	6	Evaluation of the method	7
		Defects	7
		Literature cited	8

ABSTRACT

A considerable savings in manpower may be effected by operating tuna long-line gear from a rotating tub rather than by handling it in the conventional manner. Instead of using individual baskets of line which must be separated and joined together for each day's fishing, a continuous mainline is set from, and hauled into a wooden storage drum. Conventional gear requires but few changes to fit it for the new method of operation.

INTRODUCTION

This is the third report on the construction and operation of the long-line gear used by the Pacific Oceanic Fishery Investigations (POFI), U. S. Fish and Wildlife Service, in a program of exploratory tuna fishing in central Pacific waters. It describes a new technique for handling long-line gear called the "tub" method, which saves manpower as compared with conventional long-line fishing methods. Earlier descriptions of the design and operation of long line, as developed at POFI, were given by Niska (1953) and Mann (1955).

In this report, "long-lining" refers to the set-line method of fishing used in the Japanese and Hawaiian high-seas fisheries for tunas and spearfishes. The gear is constructed so that a series of baited hook droppers is suspended from a long mainline, usually several miles in length; the mainline is buoyed up at regular intervals by buoys and floatlines. Unanchored, the gear drifts with wind and current with the hooks fishing at 100 to 500 feet below the surface.

The Japanese have found long-lining to be an effective way of harvesting tuna, and a large part of the Japanese commercial tuna catch is taken by this means. The long line, however, is not utilized to any great extent by United States fishermen. Two major drawbacks to this method of fishing, as now practiced, have prevented its general acceptance by the American industry. First, the method is non-selective, as far as catch is concerned, so that fish of various species and sizes are taken on the gear. This presents no hindrance in a fresh-fish economy such as Japan possesses, in which there is a steady market demand for fresh fish of all types, but it does present some problems to the United States canning industry accustomed to dealing with fish of uniform size and species. Secondly, a comparatively

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large number of men are required for long-lining. The relatively low concentration of tuna in most regions of the open sea makes it necessary to set a large amount of gear over a wide area in order to insure a commercial return. Japanese vessels, fishing from 1,200 to 1,500 hooks a day, require more than 20 men for assembling, baiting, setting, hauling, and restowing the gear. An American purse seiner or live-bait vessel of comparable tonnage usually has a crew of about 12 men.

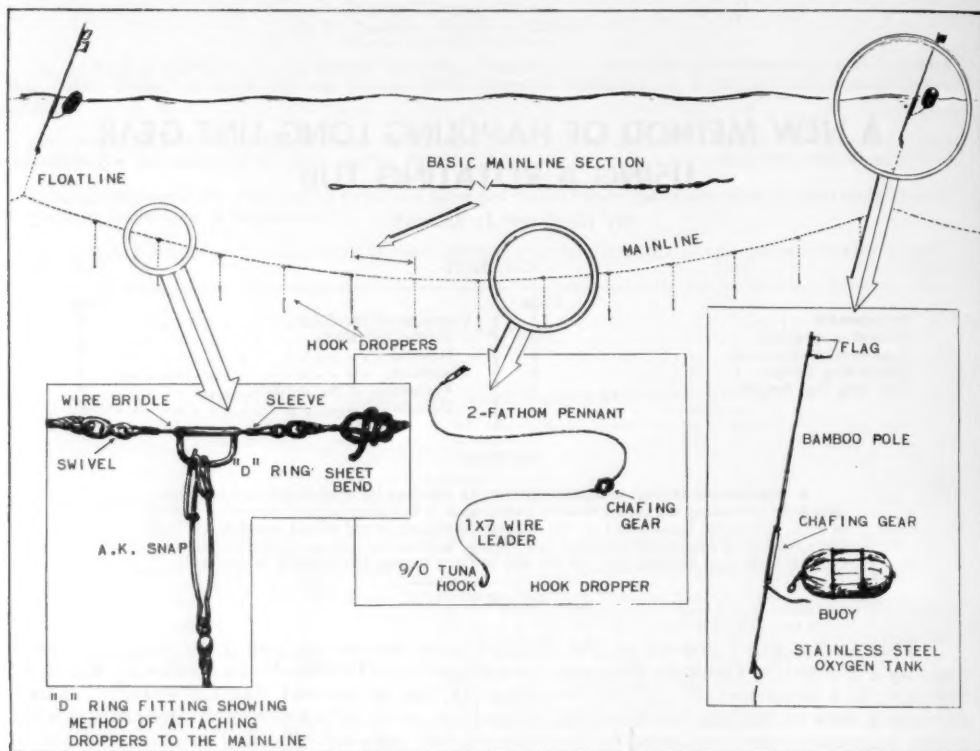


Fig. 1 - Schematic diagram of one basket of tub gear.

POFI has made several attempts to modify the long line so as to reduce the number of men necessary to operate the gear. For example, a "drum line," which consisted of a mainline in one continuous length reeled on a wooden drum instead of being broken down into separate units was tried experimentally. In another scheme, wire rope was substituted for cotton twine for the mainline, and high-speed multiple-drum winches were used to set and retrieve the gear. In both of these methods difficulty was experienced with winch inertia problems and with the devices for attaching droppers to the mainline in the setting operation. Neither scheme offered enough promise to justify the continuation of its development.

RECENT INNOVATIONS

The latest modification of tuna long-lining, the tub method described here, has proven successful in experimental fishing. With this method, the mainline, in one continuous length, is set from, and hauled into the wooden storage tub that gives this method its name. The droppers and floatlines are detachable and are removed from the mainline during hauling operations and reattached during the setting process.

By eliminating the handling of the mainline, a considerable saving in labor is effected. Fishing cruises aboard the Bureau's research vessels John R. Manning and Commonwealth, during which the new method and the conventional method of handling gear were compared, showed that the usual POFI set of from 60 to 100 baskets of gear could be made by 5 men, or less, using the tub method, whereas, the full crew of 11 men was necessary to operate conventional gear.

Shown in figure 1 is a schematic representation of one basket of POFI experimental long line. Except for the "D" ring (shown in the insert, lower left), the gear is of the standard POFI design described in detail in a previous report (Mann 1955). The "D" ring, a nonstandard fitting designed by POFI, is also a new development. Its function is to provide free-swivelling action between dropper and mainline at any

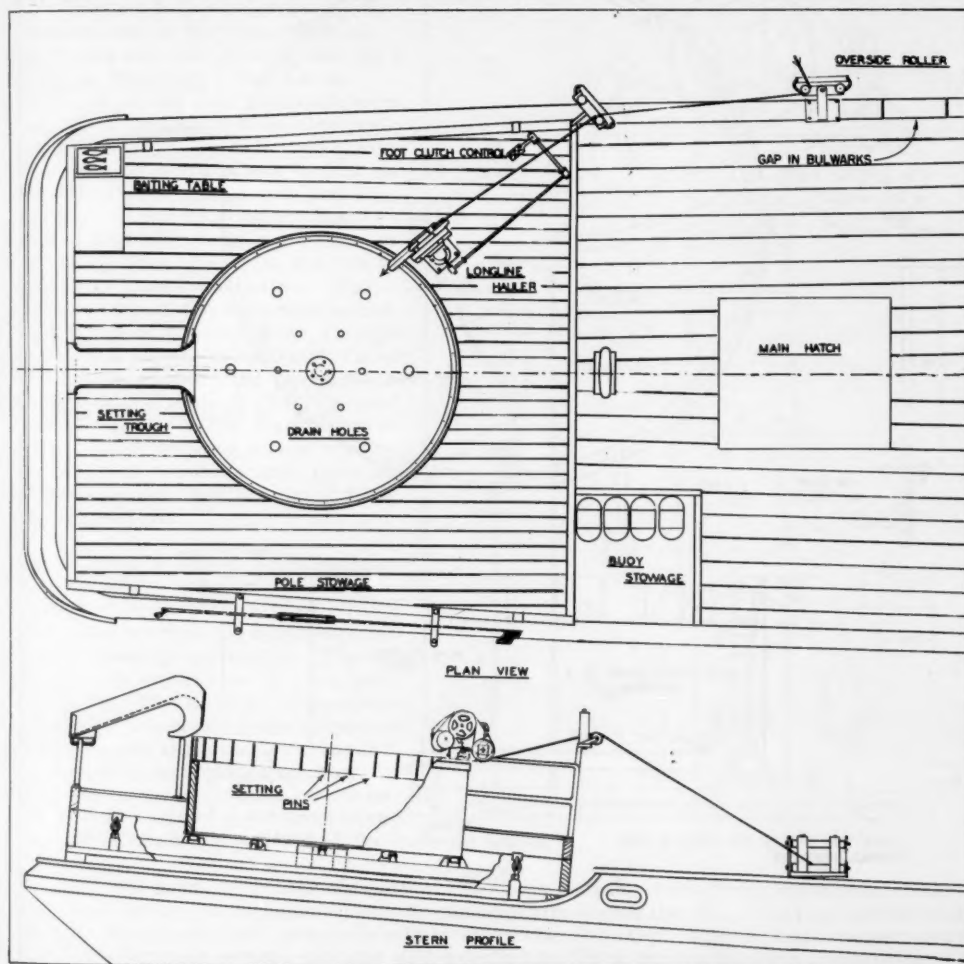


Fig. 2 - Installation of the line-storage tub on the John R. Manning.

angle of pull. Formerly the AK snaps were clipped directly to the wire bridle. This means of attachment ordinarily permitted the dropper to swivel around the mainline and thus prevented tangles of dropper and mainline, when the gear was being hauled

aboard the vessel, but it frequently failed to function properly when large fish pulled the dropper parallel to the mainline. At acute angles under strong tension, the snap ceased to have any swivelling action and sometimes was pulled out of shape or broken.

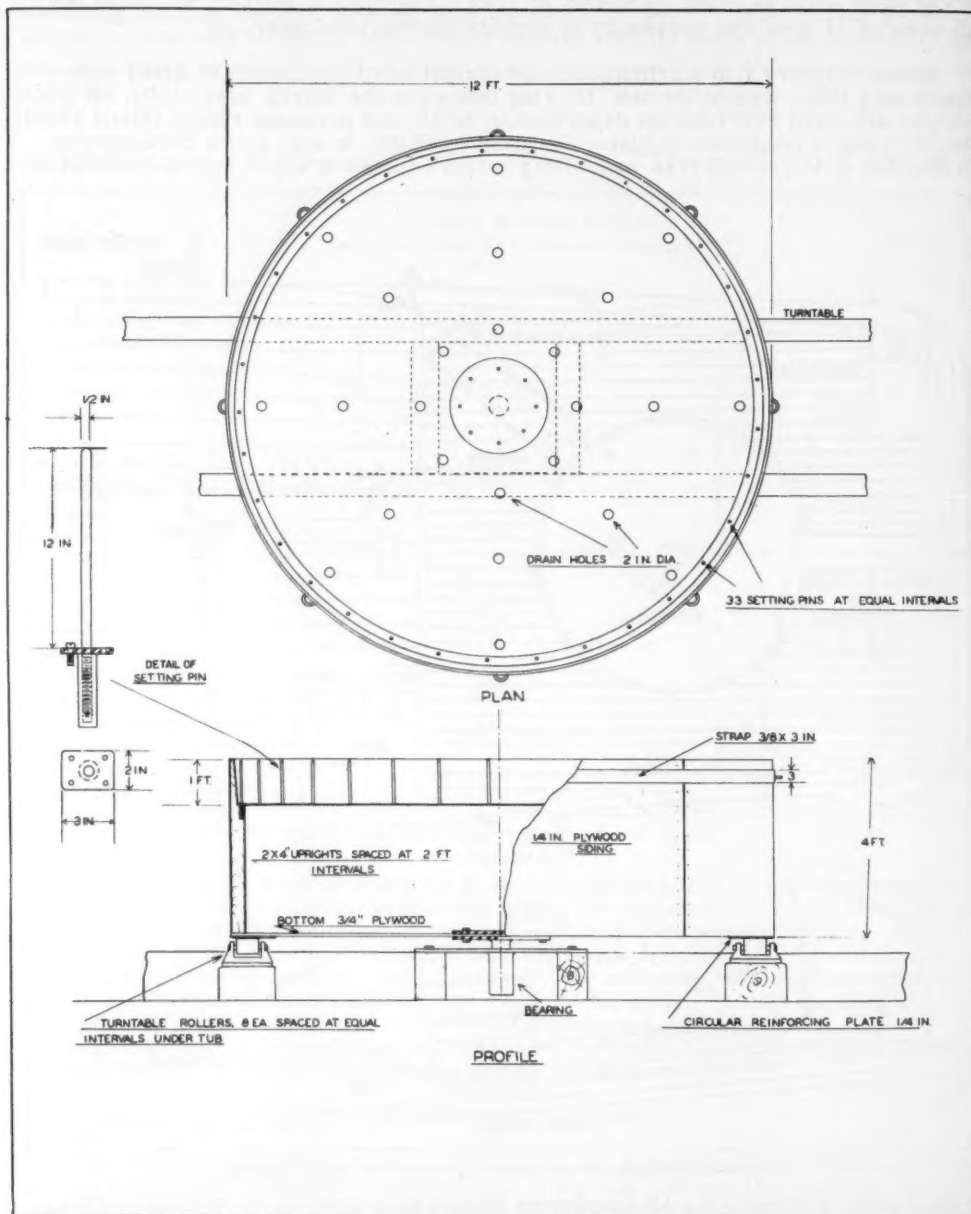


Fig. 3 - Construction details of line storage tub.

The new "D" ring maintains proper swivelling action with the dropper leading in any direction. The rings are fabricated from a section of stainless steel tubing $\frac{5}{16}$ -inch outside diameter and $\frac{3}{32}$ -inch inside diameter. The lower section of $\frac{3}{16}$ -inch diameter stock is formed in a U-shape and welded to the tube section. The rings are threaded on a wire bridle made up of a 6-inch length of $\frac{3}{32}$ -inch diameter 7 x 7 stainless steel wire rope. Wire loops holding brass swivels at each end of the bridle are made by pressing Nicopress fittings on the wire with a hand tool. Swivels are used to relieve torque which develops while the long line is being brought in by the hauler.

CONSTRUCTION OF THE TUB

Figure 2 is a schematic representation of the experimental long-line tub installed on the M/V John R. Manning. The tub is mounted on the stern turntable in the space normally occupied by the purse seine on this type of vessel. Ample work space is left on all sides between the tub and the railing. A heavy combination thrust and side bearing, bolted to the main deck, permits the tub to rotate in either direction. The bottom rim of the tub, reinforced with a circular steel plate, runs on a set of 8 cast-iron rollers formerly used to support the purse-seine turntable. The deck gratings and railing on top of the turntable provide a safe working space above the wash of the seas and make the tub easily accessible during fishing operations.

Figure 3 shows construction details of the tub. Inner and outer shells of the tub consist of panels of $\frac{1}{4}$ -inch marine plywood with the grain running vertically. The two shells are separated by 2 x 4-inch uprights. The bottom is constructed of two panels of $\frac{3}{4}$ -inch plywood. Two-inch drain holes are spaced at intervals around the bottom. The tub is strengthened by circular steel bands of $\frac{3}{8}$ -x 3-inch strap welded to form rings around the outside walls.

Setting pins, of $\frac{1}{2}$ -inch diameter x 12-inch length, made from stainless steel rod, are spaced at equal intervals around the rim inside the tub. The pins are threaded into stainless steel bases firmly mounted on the step. These pins are securely mounted because severe strains are exerted on them during hauling operations when the mainline is packed down into the tub by trampling upon it.

The tub on the John R. Manning is 11½ feet inside diameter and 4 feet in height. This size allows for storage of 100 baskets of POFI mainline gear. The tub, as presently designed, is rotated by hand. If large amounts of long-line gear are to be fished commercially, some system of turning the tub by power is desirable.

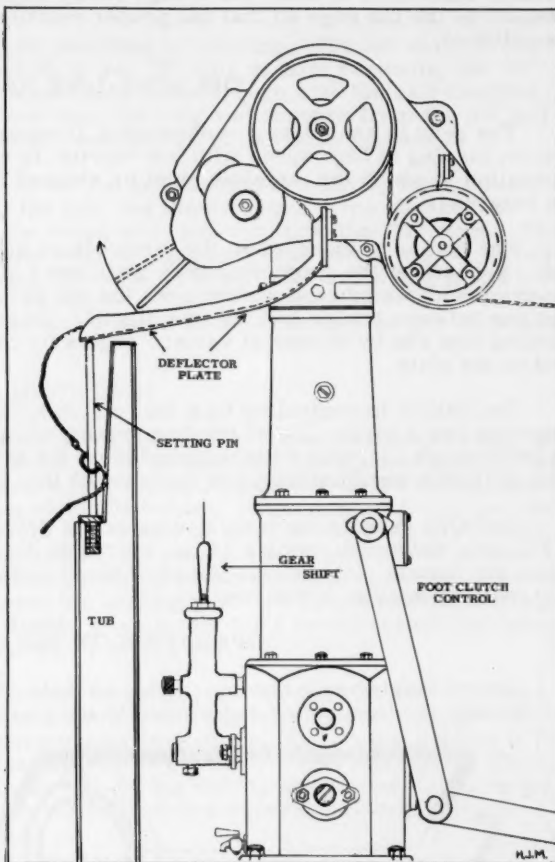


Fig. 4 - Arrangement of the tub and long-line hauler.

THE SETTING TROUGH

The setting trough (fig. 2) is a demountable sheet metal form used to confine and guide the outgoing mainline during the setting process. In general appearance it is similar to the type used in the halibut fishery of the eastern North Pacific. The inboard lip of the trough is mounted above the tub edge and slightly inboard of the setting pins. In the original installation, some difficulty was experienced in getting the "D" rings to lift smoothly from their setting pins. It was necessary, therefore, to make the trough easily adjustable in height and distance in respect to the tub edge so that the proper relation between pin and trough could be established.

THE LONG-LINE HAULER

The gear is hauled by a conventional Japanese long-line hauler. This type of winch, turning at high speed with low inertia, is especially adapted to the long-line operation in which the mainline must be stopped frequently so that droppers can be removed.

The hauler is mounted on the turntable as close as possible to the edge of the tub. Because of the projecting gear shift lever of the winch, the hauler cannot be mounted with its inboard sheave over the tub and a deflector plate is used to bridge the gap between hauler and tub (see fig. 4). This plate is adjustable so that the incoming line can be thrown at various angles by changing the height of the inboard end of the plate.

The hauler is controlled by a foot clutch mounted at the rail, so that the winch operator has a clear view of the line coming aboard. To aid in landing fish, the line is led through overside rollers mounted on the starboard side of the main deck. The droppers and floatlines are detached at this lower level.

On POFI vessels the long-line hauler is driven by a 3 hp. electric motor through a 5:1 gear reduction, or by a 14 hp. hydraulic drive. An input speed of 300 revolutions per minute yields a line speed of about 1,000 feet per minute in high gear and 500 feet per minute in low gear.

OPERATION OF THE GEAR

Before leaving on a fishing cruise, baskets of mainline are knotted together and fed through the line hauler and stowed in the storage tub. No attempt is made to

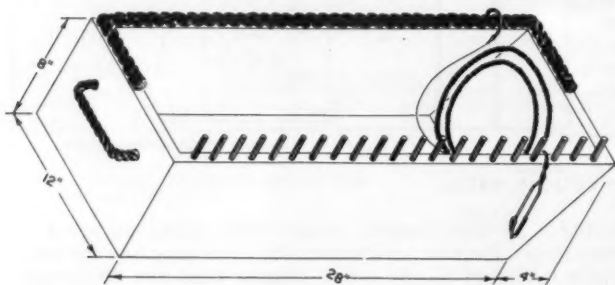


Fig. 5 - Dropper storage box.

coil the line down uniformly but it is distributed on the bottom of the tub by changing the angle of the deflector plate from time to time so that line is thrown from one side of the tub to the other.

As the "D" rings pass through the hauler they are caught by one fisherman and threaded on the setting pin nearest the winch (see fig. 4). All rings for one basket are placed on a single pin and the cloverleaf knot marking the end of the basket is looped on top. The tub is then turned by hand until an alternate pin comes in line with the winch. (Rings of successive baskets are threaded on alternate pins to prevent lines from piling up too much in one place.) After the tub has made one complete revolution the process is

repeated until three layers of 33 baskets each are in place. The tub is covered by a tarpaulin to keep the line from being disarranged before setting.

SETTING OPERATION: When setting the gear, the vessel is steered on a desired course at speeds up to nine knots. The tub is turned until the setting pin of the top basket lines up with the center of the setting trough. The end of the mainline is led through the setting trough. The floatline and buoy with pole are attached and the assembly is thrown overboard. Thereafter the drag of the end basket pulls the mainline from the tub.

The hook droppers are baited with sardines or herring. The AK snap, at the upper end of the dropper, is snapped on to the "D" ring without removing the "D" ring from its pin, and the dropper is then laid in the trough with the bait dangling overboard. The outgoing mainline snatches the ring and dropper from the pin and carries them overboard. Floatlines are snapped on in the same manner.

HAULING: The gear is hauled in the normal fashion by running the mainline through the longline hauler and into the tub. As the droppers come aboard, the winch is stopped momentarily and the snaps are removed from the "D" rings. The droppers are coiled and packed in specially designed plywood boxes (fig. 5). These have sloping ends to facilitate stowing the coils on edge. The hooks and snaps are secured to opposite sides of the box as shown. The "D" rings are threaded on pins as described before. Fish are gaffed and brought aboard through the gap in the rail shown in figure 2.

DISCUSSION

EVALUATION OF THE METHOD: Although still in the experimental stage, and with a great deal of developmental work yet to be done, the tub method appears to be commercially practicable. When employing the usual methods, POFI crews, consisting ordinarily of 11 men, fishing 60 to 100 baskets of gear, must break out, assemble, disassemble, and restow from 1 to 2 tons of wet line for each day's fishing. By eliminating the handling of the mainline, the size of the fishing crews may be reduced by more than one-half. Operation times for both methods are about the same, averaging about $3\frac{1}{2}$ minutes per basket for hauling gear and $2\frac{1}{2}$ minutes for setting. Thus, by this new method it would appear practicable for a small vessel, carrying 4 or 5 men, to fish 100 or more baskets of gear a day.

DEFECTS: It should be emphasized, however, that the method has only been tried experimentally and that additional testing and experience with the gear are necessary to insure satisfactory commercial application. Only a few defects in design have been noted so far, but these appear to be minor. One anticipated difficulty, that of fouling of the mainline in the tub during setting operations, failed to materialize. Indeed, less fouling by the tub method was experienced than when assembling and setting baskets by hand.

The most serious drawback noted so far is the excessive wear and tear on the mainline at the bridles caused by the impact of the "D" rings on rollers and longline hauler during hauling operations. In an effort to overcome this, the rollers have been made larger in diameter and the "D" rings have been reduced in size. To eliminate the difficulty altogether, a method of joining the droppers to the mainline by a system which swivels as freely as the "D" ring method, but which has less bulk, is needed.

Another defect of the present gear is that the knots which join the mainline sections abrade rapidly by passage through the haulers, so that the line at the knots needs recutting and splicing before the mainline itself is worn out.

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NUMBER OF TAGGED HADDOCK CAUGHT MORE THAN ONCE

In the July 1958 issue (p. 18) of Commercial Fisheries Review appeared a report of a tagged skipjack tuna caught three times within 16 days. Two biologists of the North Atlantic Fisheries Investigations, U. S. Bureau of Commercial Fisheries, Woods Hole, Mass., report two similar experiences with tagged haddock.

One haddock was originally tagged June 30, 1956, from one of the Bureau's research vessels about 85 miles off the Massachusetts coast, near Cashes Ledge. It was one of 250 haddock tagged at that location as part of a study of the definition of stocks and migrations of the species. Long-line gear was used to capture the fish.

On November 2, 1957, the same haddock was again captured, this time in the otter trawl of the Bureau's research vessel Albatross III, but still in the same area near Cashes Ledge. The fish was measured and released.

The fish was captured for the third and final time by the Boston commercial otter trawler Arlington on June 15, 1958, about 95 miles south of the Cashes Ledge area on the western side of Georges Bank. In the two years that had elapsed from the original tagging to its capture by the M/V Arlington, the haddock had grown in length a total of 6.2 centimeters (2.4 inches) in spite of his hazardous existence.

Also a cod tagged from the commercial line trawler Alice and Nancy on the Pollock Rip grounds on March 5 was captured a second time on March 11 by the same boat. The skipper, familiar by now with tagging operations, re-released the fish after noting the tag number. The cod was taken for the third and last time by another line trawler in the same general area on April 4. The cod had taken the hook three times in just one month.

The biologists report that they have recorded many similar experiences with tagged fish.



RESEARCH

IN SERVICE LABORATORIES

TECHNICAL NOTE NO. 46 - METHOD FOR REMOVING BLOOD FROM HALIBUT TO IMPROVE APPEARANCE OF FROZEN STEAKS

INTRODUCTION

The attractive appearance of fish steaks often is marred by blood stains. These stains are especially noticeable when frozen white meat, such as that of halibut, is thawed, but the stains also are evident even in the reddish-orange meat of salmon.

The blood causing most of this discoloration comes from the large blood vessel that runs down the length of the fish adjacent to the backbone. This blood can be observed readily if certain frozen halibut and salmon steaks are examined. When these steaks are thawed, an objectionable dark red stain usually is found in the meat surrounding the blood vessel. The drip, or free liquid released by the frozen meat as it thaws, also may be discolored red by the blood. These stains make the product much less appealing to the consumer.



Fig. 1 - Piece of meat cut from tail section of a halibut to expose blood vessel. In commercial practice, the cut need only be large enough to allow water that is under pressure to flow through it.

This problem can be overcome by a simple procedure. The purpose of this paper is (1) to describe this procedure and (2) to report on its effectiveness.

PROCEDURE

While the belly cavity is being washed prior to freezing the fish, remove the blood as follows:

1. Make a small cut to expose the blood vessel at the tail (fig. 1).

2. Attach to a water hose an adapter that reduces the diameter of the water outlet to about $\frac{1}{4}$ inch (fig. 1).

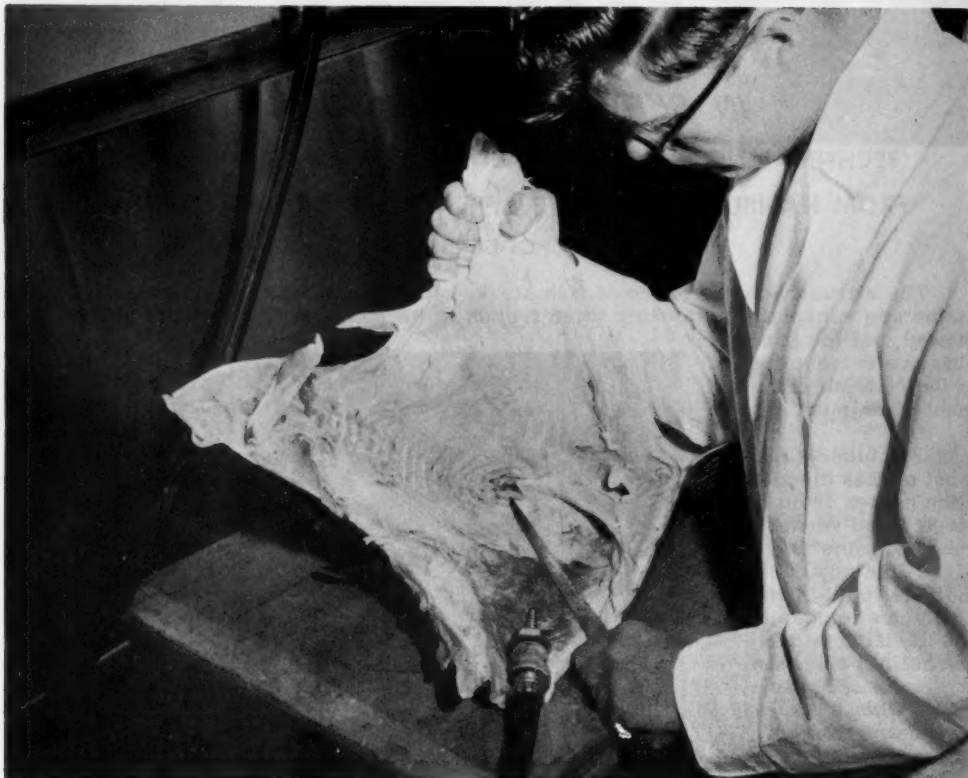


Fig. 2 - Location of blood vessel in belly cavity of halibut. The knife is used here simply as a pointer, for the blood vessel already was exposed at the time the fish was eviscerated. In order that the opening to the blood vessel could be photographed, the belly wall was cut farther than is usual in commercial handling.

3. Insert the adapter into the opening of the blood vessel in the belly cavity (figs. 2 and 3).

4. Using a stream of water, flush the blood out through the cut in the tail section.

This procedure has been used only with halibut. It should be applicable, however, to other fish, such as the large salmon used in mild-curing, where it is desirable to get rid of all possible blood.

EFFECTIVENESS

We found that this simple operation could be carried out simultaneously with the washing of the belly cavity. Inasmuch as the industry already customarily washes the belly cavity of halibut prior to freezing them, the removal of the objectionable blood therefore requires very little additional time. Furthermore, this operation resulted in no loss of the edible portion of the halibut and did no damage to the edible meat.

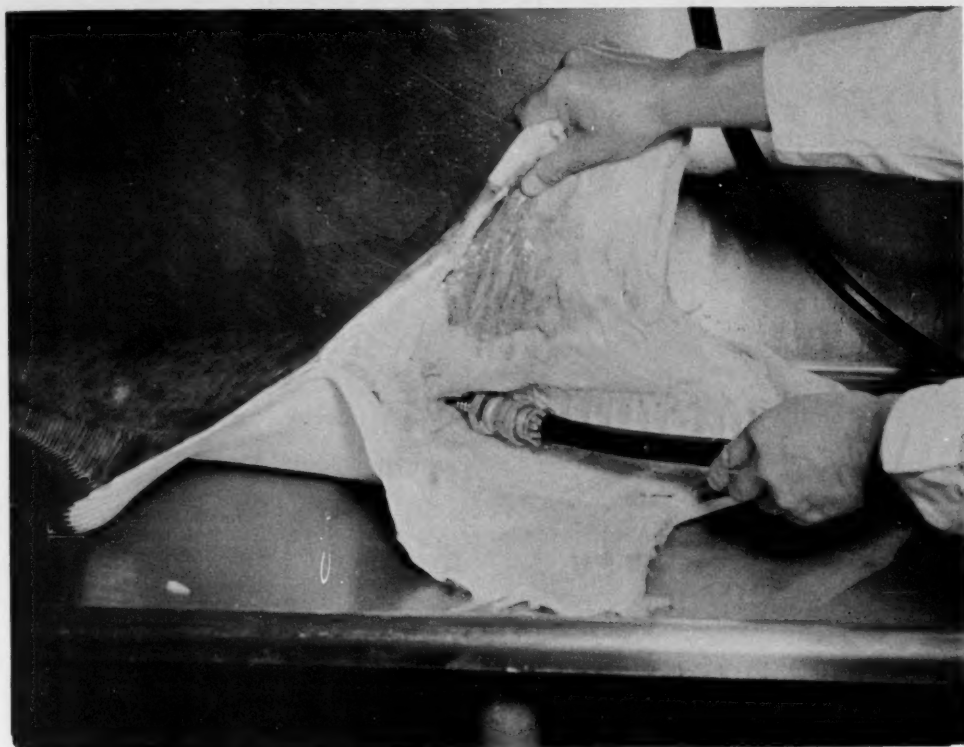


Fig. 3 - Method of inserting water cock into blood vessel.

When frozen steaks cut from halibut that had been experimentally washed were thawed and closely examined, none of the steaks were found to have blood stains.

CONCLUSIONS

A stream of water from a water hose can be used to remove the blood from the large blood vessel in the tail section of halibut. This method is rapid and simple; yet it effectively keeps blood stains from forming in halibut steaks.

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STUDIES ON THE RELATIONSHIP OF FISH OILS TO CIRCULATORY DISEASES INITIATED

A research project to study the relationship of fish oil in the diet to cholesterol deposits in the circulatory system of the body has been authorized by the U. S. Department of the Interior, Bureau of Commercial Fisheries. The research is expected to contribute to the fund of information being compiled on various phases of arteriosclerosis, particularly the coronary types.

It is the unsaturated fatty acids (unstable and susceptible to chemical change) which abound in fish oil that are the center of attention. Studies already made under the Saltonstall-Kennedy Act for the improvement of domestic commercial fisheries have shown that fish oils contain a greater amount and a greater diversity of these unsaturated fatty acids than do many other food fats. The current investigations are also being made with funds provided by the Saltonstall-Kennedy Act.

In one experiment miniature pigs are being used to determine the deposition of cholesterol in the body. Fish oil fatty acids of known degrees of unsaturation will be fed to the test animals. Ultimately the animals will be killed and the arteries examined to evaluate the effects of the several diets employed.

Another test will be made on rats to determine which of the many fish oil fatty acids are essential to physiological welfare. One objective is to determine the relationship of fish oils to metabolism and fat transport in the body, while still another is probing the properties of fish oil that may have pharmaceutical applications.



SALMON CLUB SANDWICHES

Canned salmon is a type of sandwich filling that is tasty and colorful and particularly appetizing. The flavor combines excellently with other foods and the texture is firm and moist.

Here is a special recipe for "Salmon Club Sandwiches" kitchen tested by the home economists of the U. S. Fish and Wildlife Service.

SALMON CLUB SANDWICHES

1 CAN (16 OUNCES) SALMON	$\frac{1}{2}$ CUP MAYONNAISE OR SALAD DRESSING
3 TABLESPOONS CHOPPED CELERY	18 SLICES BUTTERED BREAD
3 TABLESPOONS CHOPPED SWEET PICKLE	4 TOMATOES, SLICED
3 TABLESPOONS CHOPPED ONION	12 LETTUCE LEAVES

Drain salmon. Flake. Combine with celery, sweet pickle, onion, and mayonnaise. Spread 6 slices of bread with salmon mixture; cover each with a second slice of bread and place tomatoes and lettuce on each; cover with remaining 6 slices of bread. Fasten sandwiches with toothpicks. Cut into quarters. Serves 6.



TRENDS AND DEVELOPMENTS

Alaska

SILVERS RETURN HOME TO KETCHIKAN HATCHERY: A total of 114 adult silver (coho) salmon had returned up to September 8, 1958, to the pond at the Ketchikan Deer Mountain Hatchery according to the Director of the Alaska Department of Fish and Game.

These salmon could be identified as they were all marked by the removal of the adipose and left ventral fin when they were released from the hatchery as fingerlings in 1957. The fish are the progeny of eggs taken from seven female silvers at Reflection Lake in October 1955.

The District Biologist in the Ketchikan area who has been in charge of this project said that more silvers are now in Ketchikan Creek and would probably be entering the hatchery pond for at least another month.

The salmon returning to the hatchery from salt water enter Ketchikan Creek and proceed upstream to a ladder which leads the fish by a series of pools into the hatchery pond. These are the same ponds in which the fish were reared to downstream migrants. The ladder was constructed by the Alaska Department of Fish and Game in 1957 to take advantage of the fact that salmon normally return to the area in which they were hatched and reared. This procedure saves much time and costly effort over the usual weir installations and seining used by most hatcheries. The fish are held in the pond areas until ripe when the eggs are taken from them.

The returning silvers are part of an experiment to determine if a suitable brood stock can be produced to return to the hatchery and thus provide a surplus of fry. These salmon fry will be used to start runs in areas which have been opened by fishways and in planting lakes which have been chemically treated to remove the competing and predaceous fish.

SOUTHEASTERN LAKE SYSTEMS REHABILITATED FOR USE IN SALMON REARING: Six lakes were chemically treated during the late summer by the Alaska Department of Fish and Game in the Petersburg-Wrangell and Ketchikan areas to remove all resident fish, the Director announced on September 8, 1958.

These lakes, three in Ideal Cove and three in the Tsa Cove system in George Inlet, will be planted with salmon when clear of the chemical (toxaphene). These experiments will test the capabilities of the lakes for rearing salmon with the competing and predaceous fish removed. The Alaska Commercial Fisheries Division inaugurated this series of applied research experiments to determine the feasibility of using toxaphene as a tool in salmon management. "It is conceivable that a whole new concept of fresh-water salmon rearing will result from experiments such as these," the head of Division stated.

A previous experiment performed in the Afognak Island area using a different chemical, rotenone, indicated production can be raised as much as 30 times. Toxaphene, which was used in the Southeastern Alaska experiments has the advantage

over rotenone of costing about one-fiftieth as much to treat the same amount of water.

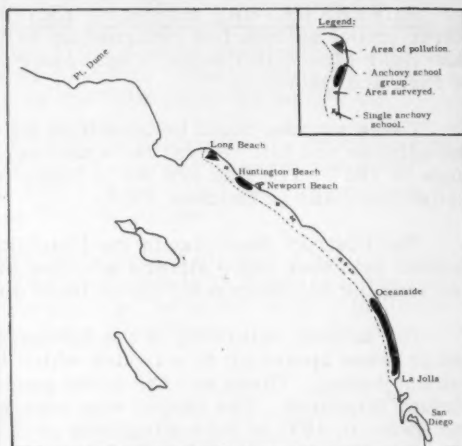


California

PELAGIC FISH DISTRIBUTION AND ABUNDANCE OFF SOUTHERN CALIFORNIA SURVEYED (Airplane Spotting Flight 58-8): The mainland coast from Long Beach to La Jolla, Calif., was surveyed on the afternoon of May 28, 1958, by the California Department of Fish and Game Beechcraft plane to observe the distribution and abundance of pelagic fish schools. Only 1½ hours of flight time was possible, so only a cursory inspection could be made of the inshore area from Long Beach to La Jolla.

Scattered schools of anchovies were observed at most localities between Seal Beach and La Jolla, but school groups were noted only in the Huntington Beach-Newport Beach and Oceanside-La Jolla areas. The Huntington Beach-Newport Beach concentration consisted of 60-80 schools in a band extending from the surf line to one mile offshore. The Oceanside-La Jolla group contained 150-200 schools and was located between the surf line and a point about two miles offshore. In both groups, the offshore schools were typically small and medium in size while those in the surf zone were larger. Some of the size differences noted between inshore and offshore schools may have been a reflection of horizontal dispersal of fishes within a school in the shallow inshore areas as compared to a vertical distribution in deeper water.

As the result of a recent Signal Hill refinery fire, heavy oil and chemical pollution was in evidence at the mouth of the San Gabriel River.



Airplane Spotting Flight 58-8 (May 28, 1958).

* * * * *

AERIAL SCOUTING CONTINUED TO STUDY PELAGIC FISH POPULATIONS AND CENSUS OF COMMERCIAL AND SPORT FISHING: Inshore Area from San Diego to San Francisco Bay (Flight 58-10, Cessna "170" 1359D): The inshore area from San Diego to San Francisco Bay was surveyed by the California Department of Fish and Game airplane spotting flight 58-10 between June 17-20, 1958. The survey was designed to determine the distribution and abundance of pelagic fish schools, and to assess the numbers and distribution of clammers, abalone pickers, skin divers, and hook-and-line fishermen.

With the exception of one day, during which visibility was poor, weather conditions were good, both for low-level shoreline counts and higher-level pelagic fish spotting. Pelagic fish spotting was conducted during the entire four-day flight. During the last two days low-level shoreline and pier surveys were made along most of the coast from Point Arguello to San Francisco.

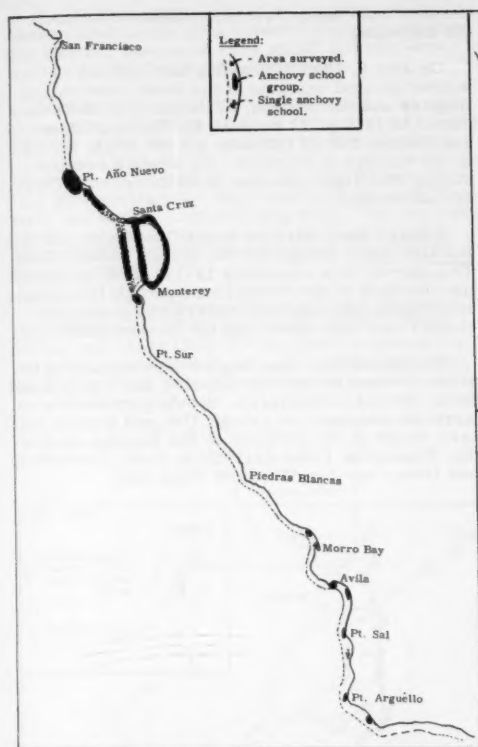
PELAGIC FISH: On the first day of the survey, scattered anchovy schools were observed from San Diego to Point Vicente. The only area in which schools occurred in large numbers was between Long Beach and Newport Beach where 250 schools

were counted. These schools were concentrated very close to shore, and many appeared as large, irregular spots in the surf. The Los Angeles-Long Beach harbor contained a scattering of large schools, with a particularly good concentration outside the Fish Harbor breakwater.

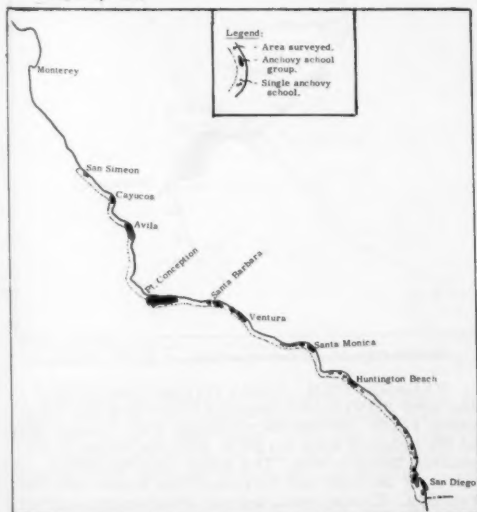
Poor visibility during the morning of June 18 made it impossible to scout the area from Point Vicente to Point Mugu. Small school groups were scattered between Point Mugu and Morro Bay, and moderate-sized groups (80-150 schools) were seen at Ventura, Oceano-Pismo Beach, and Avila.

No schools were seen between Morro Bay and Carmel, but a very heavy concentration was observed throughout Monterey Bay and north to Pigeon Point. Over 2,000 schools were tallied in this area. This major concentration could very well be the result of a southern movement of the large school group reported off San Francisco and Point Reyes during May. The final day of scouting did not reveal any fish from Pigeon Point to San Francisco.

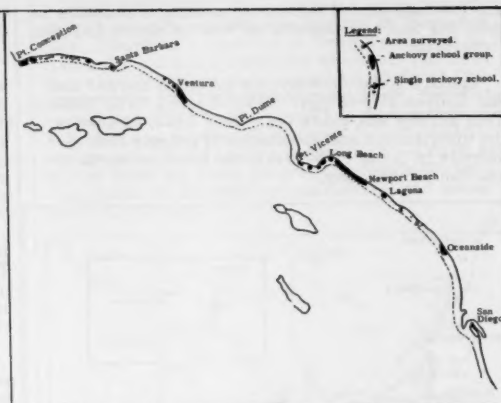
SHORELINE AND PIER SURVEY: During the two days devoted to a survey of shoreline activity,



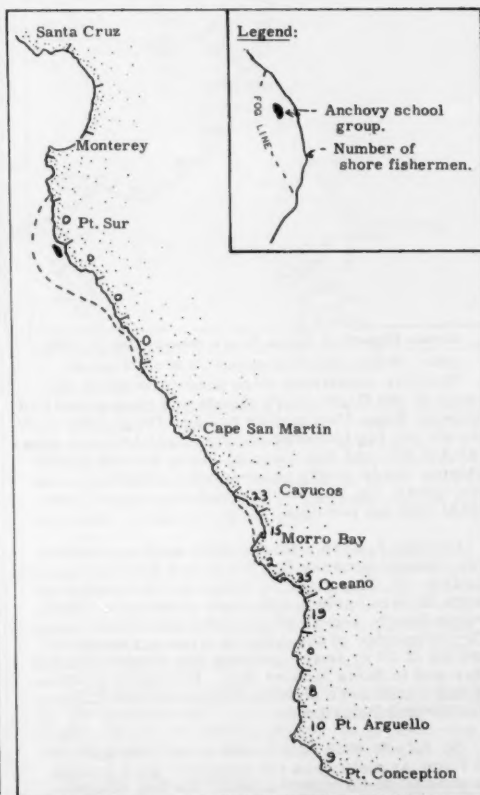
Airplane Spotting Flight 58-10 in Central California area (June 17 through 20, 1958).



Airplane Spotting Flight 58-11 (July 7 through 9, 1958).



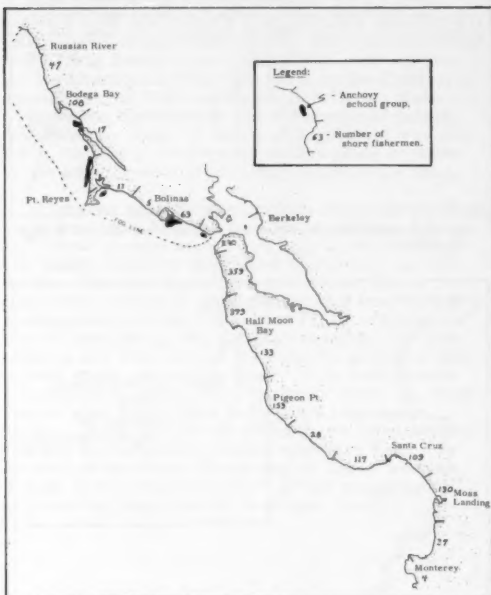
Airplane Spotting Flight 58-10 in lower California area (June 17 through 20, 1958).



Airplane Flight 58-12, Santa Cruz to Point Conception (July 12, 1958).

one low tide period occurred, making it possible to tally the beach clammers as well as shore and pier fishermen.

Inshore Area Between the Mexican Border and San Simeon Bay (Flight 58-11, Cessna "170" 1359D): This survey was made (July 7-9, 1958) to assess the distribution and abundance of pelagic fish schools in the area between the Mexican border and San Simeon Bay.



Airplane Flight 58-12, Russian River to Monterey (July 13, 1958).

Weather conditions were poor throughout the range of the flight. Low clouds and haze prevailed between Santa Monica Bay and San Diego while low clouds and fog hindered observations between Santa Monica Bay and San Simeon. Some breaks in the weather made spotty observations possible in certain areas, but in general, good coverage of the coast was not possible.

On July 7, 1958 a total of 520 anchovy schools was counted between San Diego and Point Mugu, including 155 very close to shore in the vicinity of Santa Monica harbor, 138 close to shore at Huntington Beach, and 87 off La Jolla and Point Loma. The remainder of the schools were scattered in groups of 30 or fewer between San Onofre and Del Mar and in Santa Monica Bay. Extensive patches of red water were observed between Los Angeles Harbor and Point Loma.

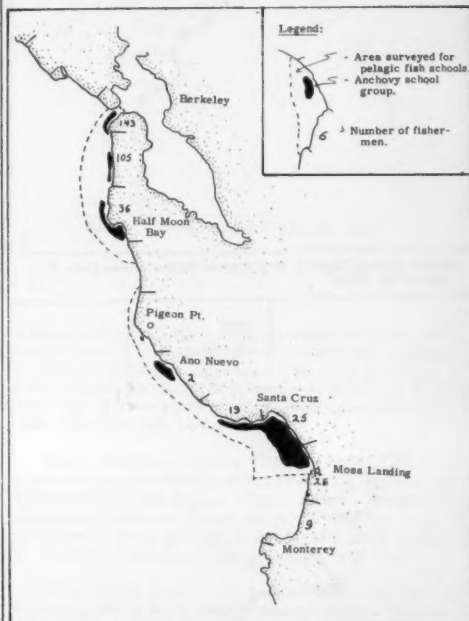
On July 8, 1958 only in the area from Gaviota to Point Arguello was the visibility good enough to permit aerial observations. No fish schools were seen between Point Conception and Point Arguello, but 442 anchovy schools were tallied between Gaviota and Point Conception. These schools varied in size from small to quite large and were

present from about five miles offshore to inside the kelp line.

On July 9, 1958 despite the fact that fog obscured several sections of the coast between Los Angeles and San Simeon, 817 anchovy schools were noted, including 277 between the Ventura River and Goleta, 262 off Gaviota, 215 off Avila, and 58 in the vicinity of Cayucos. All schools counted during this flight appeared to be composed of northern anchovies.

Inshore Area Between Point Conception and the Russian River (Flight 58-12, Cessna "170" 1359D): This survey was made (July 12-14, 1958) to assess the numbers of sport fishermen, pelagic fish schools, and commercial salmon trollers in the area between Point Conception and the Russian River.

Persistent low-lying fog prevented scouting for shore fishermen between Cayucos and Cambria and from Carmel to Monterey. Scouting conditions were not adequate for pelagic fish and salmon trollers except in the areas from the Russian River to San Francisco, Point Arguello to Point Conception, and from Cape San Martin to Point Sur.



Airplane Flight 58-13, Berkeley to Monterey (July 21, 1958).

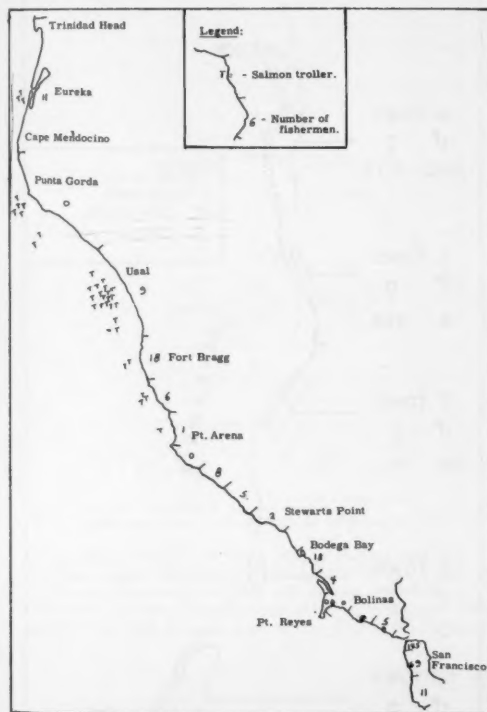
PELAGIC FISH: Good coverage was made of the area between the Russian River and San Francisco where 726 anchovy schools were tallied. Most of the schools were large in size and close to the shallow beach areas. The main concentrations were off Bolinas and between Point Reyes and Bodaga Bay. Commercial salmon fishermen reported these schools to be of the same size composition (0- and 1-age group) as in the past two months.

For the first time in five years anchovy schools were sighted in the area between Carmel and Cape San Martin. Seventeen very small schools were seen in the Pt. Sur-Partington area.

COMMERCIAL SALMON TROLLERS: No adequate census could be made of commercial trollers as much of the fishing area was covered by fog.

SPORT FISHERMEN: The striped bass run along the beaches from San Francisco South to Monterey has been exceptional this year. The numbers of surf fishermen have greatly increased in this area—almost tenfold since the week-end flight of March 2, 1958.

Inshore Area Between Monterey and Trinidad Head (Flight 58-13, Cessna "180" 3632C): This survey was made (July 21-23, 1958) to assess the numbers of pelagic fish schools, sport fishermen, and commercial salmon trollers between Monterey and Trinidad Head.

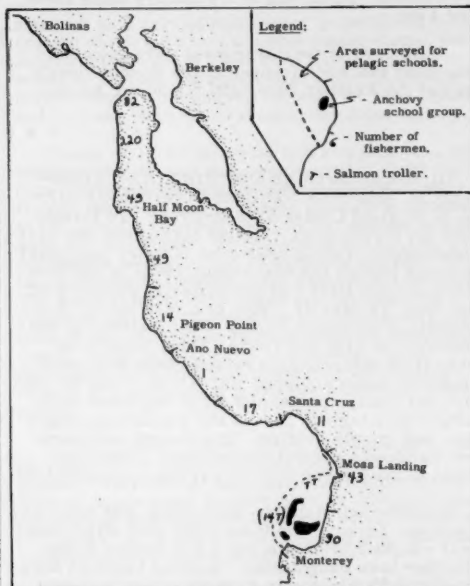


Airplane Flight 58-13, Trinidad Head to San Francisco (July 22, 1958).

Although fog continued to hamper scouting activity, all of the objectives were achieved during the three days of this flight. This was the first time since May 22 that an adequate pelagic fish census could be made in Central California.

The results of flights 58-4, 58-10, and the present flight indicate a possible movement of the greater mass of young anchovies from the Bodega Bay region south into Monterey Bay. No sardine schools were observed.

PELAGIC FISH: An extremely large concentration of anchovy schools was sighted in Monterey Bay. Nearly the entire area from the surf zone to five miles offshore contained schools. The heaviest concentrations were observed off Santa Cruz where over 4,000 schools were tallied. Bait fishermen operating in Monterey Bay report these schools to be composed of small fish (0- and 1-age group). Similar size anchovies have been reported from all along central California (Point Conception to Eureka) by commercial and ocean sport fishermen.



Airplane Flight 58-13, Berkeley to Monterey (July 23, 1958).

The number of schools tallied on this flight cannot be directly compared to the numbers sighted on previous flights this year as the average size of the most recently observed schools was much larger. Actually, the increase in abundance since May is considerably greater than is indicated by the slight increase in number of schools.

The behavior of anchovies to first appear as small schools several miles from the shoreline in spring and then gradually form into large masses and move into the shallow beach areas has been noted for several years in southern California. This phenomenon was observed in central California in 1954 and again this spring.

COMMERCIAL SALMON TROLLERS: Relatively few commercial trollers were noted on this flight. In all, 51 were sighted: 16 in Monterey Bay and 35 in the area from Elk to Eureka.

SPORT FISHERMEN: Striped bass fishermen were observed in large numbers along the beaches from the Golden Gate south to Pigeon Point. On July 23, 371 surf fishermen were tallied in this area. There were 115 surf fishermen on May 2 before the striped bass run had fully materialized and 1,019 on July 13.

CHANNEL CATFISH SPAWNING EXPERIMENTS SUCCESSFUL: Channel catfish have been spawned successfully for the first time at the Central Valleys Warmwater Fish Hatchery at Elk Grove, according to the California Department of Fish and Game.

The Department's channel catfish production program was unsuccessful until a mechanical device was developed which "fans" the eggs until they are hatched. In nature, the female keeps the eggs in motion by fanning them with her tail until they are hatched. From egg to fry usually takes about 3 or 4 days.

Fish used in the experiment were mostly 4-year-olds and were trapped in the Honcut Slough area of the Feather River and the Sutter Bypass.

The fish were paired and placed in 14 pens in one of the hatchery ponds. Each pen contained a length of tile 2 feet long by 18 inches in diameter. When the eggs, which are all loosely connected, floated to the surface, they were removed to the artificial incubator where they were hatched.

The Department hopes to obtain 130,000 eggs from which to hatch fingerlings for experimental planting in suitable waters throughout the State. Already 21,000 catfish fingerlings have been scheduled for planting in Southern California.

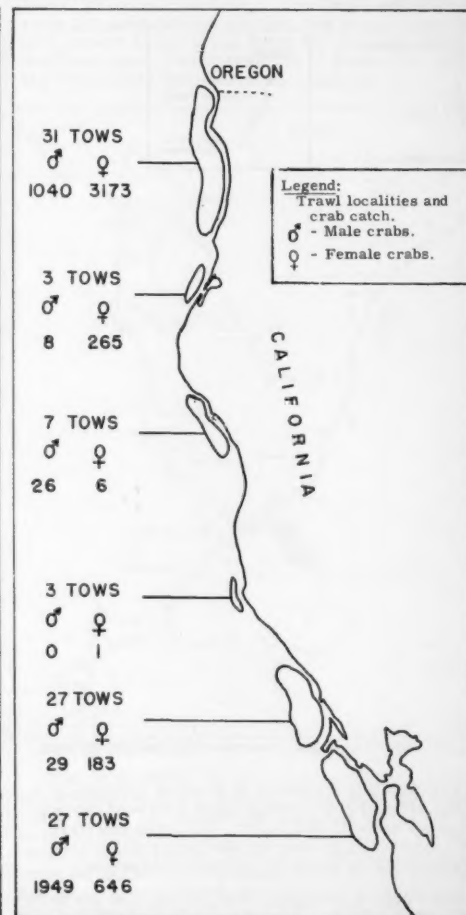
Fingerlings will be distributed to other regions for similar experimental plantings as soon as they are large enough to be planted. Central Valleys Hatchery does not have facilities to hold these fish beyond the fingerling stage.

* * * *

DUNGENESS-CRAB DISTRIBUTION, ABUNDANCE, AND SIZE STUDIES CONTINUED (M/V N. B. Scofield Cruise 58-S-3-Crab): To investigate the distribution, relative abundance, and size composition of dungeness crab (*Cancer magister*) in areas beyond the operational range of the commercial crab fleet was the principal objective of the April 15-May 27, 1958, cruise of the N. B. Scofield, a research vessel of the California Department of Fish and Game. Other objectives were (1) to determine the relative savings of small crabs for traps equipped with 4-, 4½-, and 4¾-inch circular escape ports; and (2) to tag crabs with suture-type tags as part of the population, migration, and growth studies. The central and northern California coastal waters from Pescadero Point to the Oregon border was the area surveyed.

Distribution, Relative Abundance, and Size Composition: Seventy-two tows made with otter-trawl gear caught 3,052 male and 4,274 female crabs; 26 other tows caught none. Each of these 98 tows averaged 30 minutes in duration. Depths fished ranged from 9 to 134 fathoms with the majority of tows made in depths between 20 and 40 fathoms. Best catches of male crabs were made off San Francisco in 30 to 45 fathoms and off Trinidad Head in 25 to 30 fathoms. Female crabs were in greatest abundance in depths of 16 to 30 fathoms between Trinidad Head and the Klamath River. Shoulder widths (straight-line distance across the carapace and immediately anterior to the outermost spines) of trawl-caught males ranged from 77 to 213 millimeters. Twelve percent of the males were legal (at least 160 mm. in shoulder width or 7 inches in greatest width) and 88 percent were sublegal. Shoulder widths of females ranged from 78 to 180 millimeters with the modal group at 142 millimeters.

Twenty-seven traps with no provision for escapement, set in the Crescent City-Trinidad Head area, caught 463 crabs. Thirty-two (7 percent) were legal males, 30 (6 percent) were sublegal males, and 401 (87 percent) were females. Thirteen similar traps in the Big Flat-Usal area caught 225 crabs. Of this total, 6 (3 percent) were legal males; 66 (29 percent) were sublegal; and 153 (68 percent) were females.



M/V N. B. Scofield cruise 58-S-3 (April-May 1958).

Escape Opening Studies: Fifty-seven sets each were made with crab traps equipped with 4-, 4 $\frac{1}{4}$ -, and 4 $\frac{1}{2}$ -inch escape ports. The results indicated a reduction of only 16.7 percent in the catch per trap of legal-size male crabs, but 87.5 percent less sublegal male crabs per trap was caught in the 4 $\frac{1}{2}$ -inch escape ports as compared with the 4-inch escape ports.

Crab Tagging: A total of 1,054 male crabs was tagged with the "Van Engle" suture tag. This tag consists of stainless steel suture wire with a Peterson disc and is attached along the epimeral line (line of separation of the carapace at time of molting). The advantage of this tag is that it is not lost at time of molting. Sizes of tagged crabs ranged from 118 to 185 millimeters in shoulder width. The majority of tagged crabs had shoulder widths between 140 and 170 millimeters.

YELLOWFIN TUNA AND SKIPJACK TAGGED ALONG BAJA CALIFORNIA COAST (M/V Independence Cruise 58-C-1-Tuna): Fishing was conducted (May 3-July 15, 1958) along the coast of Baja Cali-



Tuna-tagging cruise 58-C-1-Tuna (April 30, 1958-July 15, 1958).

fornia and offshore around Alijos Rocks and the Revilla Gigedo Islands by biologists of the California Department of Fish and Game aboard the commercial tuna fishing vessel *Independence*. The purpose of this cruise was to tag yellowfin tuna and

skipjack as a part of population, growth, and migration studies; to test a monel metal clamp, for securing the ends of "spaghetti"-type tags, in an effort to shorten tag application time; to collect marine organisms associated with the tuna fishery; and to make limited oceanographic observations.

A total of 1,713 yellowfin and skipjack tuna was tagged and released during this cruise along the coast of Baja California and offshore the Revilla Gigedo Islands. The yellowfin tuna were measured to the nearest one-half centimeter, but the skipjack were not measured. By the end of the cruise, 31 of the tagged yellowfin and 10 skipjack had been returned to the California State Fisheries Laboratory. The most significant of these tag returns was a yellowfin which was tagged at the Revilla Gigedo Islands and recovered 46 days later off Baja California, approximately 300 miles to the north. This movement indicates that there may be an interchange of fish between these two important fishing areas.

A small monel metal clamp was used in place of a knot to secure 436 of the tags used on this cruise. This clamp was considered superior in ease of application to other clamps tried previously, but was slower to apply than a knot. There was no obvious evidence that the holding quality of the clamp is better than a knot.

Marine organisms were collected from live-bait hauls, night-light stations, and by hook and line at 21 different stations.

Sea-surface temperatures were recorded at all fishing and baiting areas. There was no obvious relationship between the catch of tuna and the surface temperatures (64.6° to 80.1° F.) encountered on the fishing grounds. Surface temperatures in the baiting areas ranged from 62.1° to 70.2° F. Most successful bait hauls were made at the lower end of the temperature range.

NEW TYPE FISH SCREEN PROVES SUCCESSFUL: The Tracy Fish Screen, which is located at the Tracy Pumping Plant on the Delta-Mendota Canal in Central California and is designed to keep very small fingerling fish from the destructive maws of the giant pumps, is reported to be operating efficiently.

Preliminary reports on tests of the screening system, an innovation in fish-saving facilities, have shown that the device is doing exactly what it was intended to do. Evaluation of the system

by the U. S. Fish and Wildlife Service is nearing the end of the second year of a two-year program.

The screen was designed and built by the U. S. Bureau of Reclamation after four years of research conducted by the Bureau and U. S. Fish and Wildlife Service, with the California Department of Fish and Game also assisting in the research.

The screen utilizes the biological fact that fish fry float down stream tail first, instinctively avoid-

ing obstructions in their paths. Designed like a giant venetian blind with vertical louvers, the screen is placed at a 15° angle to the flow of water. Each individual louver is placed with its broad side 90° to the water flow.

The tiny fish, warned by the water turbulence set up by the louvers, are able to swim against the slow moving current while maintaining their downstream progress until they float into a bypass channel which takes them past the dangerous pumps. Collected, they are returned to the river at a downstream point, away from the pumps.

In the first year of testing, from February through September of 1957, an estimated 3,541,000

Note: Also see Commercial Fisheries Review for March 1957 p. 28 and November 1956 p. 49.

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TAG RETURNS SHOW INCREASE IN STRIPED BASS FISHING: Ocean striped bass fishing in the San Francisco area has not been merely exceptional this year--it has been sensational, the California Department of Fish and Game states.

In all the previous striped bass tagging programs, the Department has received only two tags from ocean fishermen. A total of 76 tags has been returned from the 1958 tagging program alone--10 tags from beach-side anglers.

The Department hopes to learn whether present regulations adequately safeguard the popular striped bass fishery. It is also trying to learn more about

fish, most of them as small as five-eighths of an inch long, were rescued from the pumps. This year, in only two months of testing, the U. S. Fish and Wildlife Service reported 3,437,000 fish rescued.

Some 23 species of fish have been recognized in the fish-holding tanks. The major species are striped bass, catfish, salmon, and shad, but freshwater perch and smelt, as well as sturgeon also have been rescued. Striped bass and catfish are mostly in the fry category, averaging about five-eighths of an inch in length, but they have ranged up to 6-8 inches. Salmon rescued are from 1½ inches to 5 inches long and sturgeon from 6 to 8 inches.

the fish's migrations, particularly its summer movements.

To encourage the return of tags, the Department has placed 150 "reward" tags, worth \$5 apiece, among the 4,500 striped bass tagged this year in the Sacramento and San Joaquin Rivers. The white tags, which have "\$5 reward" imprinted in red, should be returned to the Department of Fish and Game, 722 Capitol Avenue, Sacramento, Calif.

If any angler catches a tagged fish--reward or not--he is asked to send the tag to the Department at the above address, together with the date the bass was caught, the place of catch, and the name and address of the angler.



Cans--Shipments for Fishery Products January-June 1958



Total shipments of metal cans during January-June 1958 amounted to 47,211 short tons of steel (based on the amount of steel consumed in the manufacture of cans) as compared with 62,127 tons in the same period a year ago. Canning of fishery products in January-June this year was confined largely to tuna. Also packs were light for shrimp, mackerel, and sardines during the first six months of 1958.

Note: Statistics cover all commercial and captive plants known to be producing metal cans. Reported in base boxes of steel consumed in the manufacture of cans, the data for fishery products are converted to tons of steel by using the factor: 23.0 base boxes of steel equal one short ton of steel.



Croakers

CROAKER TAGGING PROGRAM IN CHESAPEAKE BAY: The possibility of catching a fish tagged with a red disc in Tidewater Virginia is "pretty good," biologists claim, for during the past spring and summer 4,093 marked croakers have been released in Virginia rivers by fishery biologists of the Virginia Fisheries Laboratory, Gloucester Point. Each disc carries a serial number and return address. When a tag is returned to the Laboratory, its number can be checked against records

by the scientists, allowing then to determine the direction in which the fish has moved and how long it has avoided capture. This information is sent promptly to the fisherman who has returned the tag, and for his services, he receives a small reward.

In general, croakers move up-river and up-bay during the spring. Tagged fish released in the Low-

er Chesapeake Bay in April of this year have been caught in Mobjack Bay, Lynnhaven Beach, and Beach Point on the Rappahannock River. One fish released at Tue Marsh Light, just off the mouth of the York River, was caught 12 days later at Parrott's Island in the Rappahannock River.

Croakers made their longest runs in the Bay during May. Fish tagged at the mouth of the Rappahannock were later caught in Maryland near Cove Point--above Patuxent River--Choptank River on the Eastern Shore, Annapolis, and Baltimore. One that wandered south was caught in a haul-seine near Walnut Point, N. C.

In summer most croakers do not move far from the tagging locality. Last summer, one tagged at Gloucester Point was recaptured on hook and line on the same spot by the same fisherman three times within six weeks.

In mid-August over 600 croakers were tagged and released in Chesapeake Bay with the hope that many of them will be caught this fall and winter, and the tags returned, enabling biologists to trace the fall migration. Croaker wintering grounds in the ocean may be identified by recaptures from trawl fishermen working on the continental shelf. If 1958 tags are recaptured in Chesapeake waters next summer this will suggest that the same population of croakers returns to the Bay from season to season. A few 1957 tags were recaptured this summer in local waters.

The following numbers of fish have been tagged this year: York River, 2,092; James River, 734; Rappahannock River, 546. Fifty-five of these tagged fish have been recovered by sport fishermen and the tags returned to the Laboratory. The cooperation of every fisherman contributes to increasing knowledge of fish movements and habits.

Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, JANUARY-JULY 1958: Fresh and Frozen Fishery Products: For the use of the Armed Forces under the Department of Defense, 3.0 million pounds (value \$1.8 million) of fresh and frozen fishery products were purchased in July by the Military Subsistence Market Centers. This exceeded the quantity purchased in June by 30.6 percent and was 0.7 percent above the

Table 1 - Fresh and Frozen Fishery Products Purchased by Military Subsistence Market Centers, July 1958 with Comparisons

QUANTITY				VALUE			
July		Jan.-July		July		Jan.-July	
1958	1957	1958	1957	1958	1957	1958	1957
(1,000 Lbs.)				(\$1,000)			
2,984	2,963	14,579	14,988	1,809	1,490	8,409	7,635

amount purchased in the same month a year ago. The value of the purchases this July was higher by 38.5 percent as compared with the previous month and higher by 21.4 percent from July a year ago.

For the first seven months of 1958 purchases totaled 14.6 million pounds, valued at \$8.4 million--a decrease of 2.3 percent in quantity, but higher by 10.1 percent in value as compared with the same period of 1957.

Table 2 - Canned Fishery Products Purchased by Military Subsistence Market Centers, July 1958 with Comparisons

Product	QUANTITY				VALUE	
	July		Jan.-July		July	Jan.-July
	1958	1957	1958	1957	1958	1958
	(1,000 Lbs)				(\$1,000)	
Tuna . . .	779	-	2,562	1,450	398	1,288
Salmon .	-	9	1,400	1,001	-	768
Sardine .	10	20	52	106	4	19

Prices paid for fresh and frozen fishery products by the Department of Defense in July 1958 averaged 60.6 cents a pound, about 3.4 cents more than the 57.2 cents paid in June, and 10.3 cents higher than the 50.3 cents paid during July a year ago.

Canned Fishery Products: Tuna was the principal canned fishery product purchased for the use of the Armed Forces during July 1958.

Note: Armed Forces Installations generally make some local purchases not included in the data given; actual total purchases are higher than indicated, because it is not possible to obtain local purchases.



Great Lakes

MORE MICHIGAN STREAMS TO BE CHEMICALLY TREATED TO DESTROY SEA LAMPREY LARVAE: The U. S. Bureau of Commercial Fisheries has been granted permission to chemically treat 18 additional streams in the upper peninsula of Michigan for the purpose of destroying sea lamprey larvae. Permission was given August 20, 1958, by Michigan's Conservation Department Director. The permit expires November 30, 1958.

The 18 new streams, all tributary to Lake Superior, bring to 30 the number of Michigan rivers and creeks where lamprey poisoning may be conducted. Earlier permits covered 5 streams flowing into Lake Superior, 5 flowing into Lake Huron, and 2 tributaries to Lake Michigan.

The Chief of the Great Lakes Fishery Investigations of the U. S. Bureau of Commercial Fisheries said the possibility of treating a number of streams this fall is likely, with minimal stream runoff and favorable weather. Several rivers and creeks have been treated during the last year.

The permit stipulates "that no substance harmful to humans, domestic livestock, or wildlife at concentrations required in the streams will be used; also that rigid controls will be exercised in the interest of protecting desirable wildlife."

Covered under the newest permit are: Waiska and Betsy Rivers, Chippewa County; Little Two Heart and Two Hearted Rivers, Luce County; Seven Mile and Beaver Creeks, and Miners and Au Train Rivers, Alger County; Big Garlic, Iron, and Pine Rivers, Marquette County; Huron River, Baraga County; Little Gratiot River, Keweenaw County; Traverse and Salmon Trout Rivers, Houghton County; Misery, Firesteel, and Cranberry Rivers, Ontonagon County.



Great Lakes Fishery Investigations

SURVEY OF WESTERN LAKE ERIE FISH POPULATIONS CONTINUED BY M/V "CISCO" Cruise 7: Trawling was conducted at 13 stations in western Lake Erie during the July 29-August 11, 1958, cruise of the U. S. Bureau of Commercial Fisheries research vessel *Cisco*. Adult yellow perch and sheepshead were common in nearly every drag, as were fry of several species. The most abundant fry were yellow perch, white bass, and smelt, but occasionally sheepshead, alewives, and gizzard shad were also numerous. No adult smelt were taken except at the easternmost and deepest station where there was a bottom layer of cold water. Very large numbers of smelt were caught there (3,600 in one 10-minute tow). The largest catch of a single species was of emerald shiners of which more than 10,000 were caught in a 10-minute tow, but this species was sometimes scarce. Some

emerald shiners and an occasional sheepshead were in spawning condition. The following species were also caught in the trawls: carp, goldfish, spottail shiner, silver chub, trout-perch, logperch, channel catfish, brown bullhead, smallmouth bass, and very few yellow pike (walleye). White crappie and mooneye were caught in Sandusky Bay only.

A limited amount of nighttime midwater trawling was done southeast of Kelly's Island. Smelt fry and emerald shiners were fairly numerous at midlevels, and white bass fry, gizzard shad, spottail shiners, and yellow perch were also present.

In order to collect fish larvae, half-meter, large-mesh (no. 32 grid gauge) plankton nets were towed alongside the boat, and a smaller net was often attached to the headrope of the trawl. Larvae

were fairly numerous near the surface in several areas. These fish larvae are as yet unidentified, but are believed to be mostly emerald shiners.

Thermal conditions in western Lake Erie during this cruise were little different from those of the previous cruise, except for slightly higher surface temperatures, which ranged mostly from 23°-25° C. (73.4°-77.0° F.). Extremes were 22.0° C. (71.6° F.) and 26.7° C. (80.1° F.). There was no pronounced stratification in water of depths less than 6 fathoms. Oxygen concentrations remained low (as low as 2.8 p.p.m.) below the thermocline in the deeper areas visited. Concentrations of oxygen at a depth of 12 meters appeared to undergo little diurnal changes.

The M/V *Cisco* and M/V *Musky* of the U. S. Bureau of Commercial Fisheries, and the vessel SP-2 from the Ohio Division of Wildlife, cooperated in three synoptic surveys of western Lake Erie during August 5-7. The vessels followed the courses established during the synoptic surveys of May 13-15 (cruise 3). Similar synoptic cruises are scheduled for the fall of 1958. Surface temperatures and water samples were obtained at 2-mile intervals by each vessel. At intervals, 195 drift bottles were released among the islands, especially near the Detroit and Maumee River mouths and in Pelee Passage. Analyses for total alkalinity and turbidity were made on most water samples taken by the *Cisco*. Bathythermograph lowerings were made at 4-mile intervals from the *Cisco*, and at 5 stations by the *Musky*. Fluorescein dye was released from the SP-2 to obtain additional knowledge of the complex currents around the islands. Wind velocity and direction, wet and dry bulb temperatures, barometric pressure, sea state, and cloud coverage were recorded. Similar data were to be obtained from various shore weather stations.

Of the total 195 drift bottles released, 21 have been returned. Bottles released in the Detroit River channel traveled eastward and were recovered along the north shore from Colchester to the Leamington, Ontario, light. Bottles released near North Harbor Island Reef and 8 miles east were found near Pelee Point. The recovery of several bottles on Kelly's and South Bass Islands indicated a northeast movement from their points of release.

Preliminary analyses of turbidity, total alkalinity, and surface temperature measurements indicate that the main outflow of the Detroit River passed between Colchester and Middle Sister Island on August 5. The southern edge of this current extended further south on the second day and was 2 miles north of West Sister Island by August 7. Detroit River water could be detected by its slightly lower temperature, 23.2°-24.0° C. (73.7°-75.0° F.), lower turbidity (3.2-4.3 p.p.m.), and total alkalinity (78-83 p.p.m.). The higher turbidity (10-16 p.p.m.) and total alkalinity (93-122 p.p.m.) northwest of Maumee Bay suggests a movement of Maumee River water into this area. Dye released among the islands moved in a northeasterly direction substantiating the movement established from return of drift bottles. Exceptionally higher turbidity (92 p.p.m.) and total alkalinity (128 p.p.m.) occurred at the mouth of the River Raisin. This was undoubtedly due to the dredging being done in the area during the synoptic surveys.

On August 6 the *Cisco* was caught in a violent storm off Maumee Bay. Wind gusts of 70 m.p.h. were recorded. Although the water depth was 15 feet, turbulence extended to the bottom within 20 minutes since the surface turbidity increased from 11.7-16 p.p.m. and total alkalinity from 101-121 p.p.m. during this time.

Cruise 8: Fishing operations, principally trawling, and collection of hydrographic data were continued in western Lake Erie by the U. S. Bureau of Commercial Fisheries research vessel *Cisco* during the August 19-30, 1958, cruise. All areas of previous cruises were revisited and additional trawling was conducted in Sandusky Bay and in deeper water of the western basin.

Fish continued to be scarce in the far north-western corner of the lake. Sheepshead and 2-year-old yellow perch were abundant in most of the other areas. Yellow pike (walleyes) were scarce at all locations. Emerald shiner catches were irregular, but large schools were occasionally encountered throughout the island region. Channel catfish were also common in the island area. Large carp were present south of Middle Sister Island where a 10-minute tow took 10 carp weighing 117 pounds. Smelt, other than fry, were still absent from the warmer waters of the western basin and were confined to a habitat near the thermal discontinuity layer in deeper water. Several perch and one sheepshead were caught at a station north of Lorain, Ohio, where the oxygen content was only 1.0 p.p.m. at 10 fathoms. Nearby at 9 fathoms, the discontinuity layer was very close to the bottom with ample oxygen of 6.7 parts per million present. A large catch of smelt and yellow perch was obtained. Other species included alewife, brown bullhead, gizzard shad, logperch, smallmouth bass, silver chub, silver lamprey, white bass, and white crappie.

Small fish fry were collected with large-mesh plankton nets towed beside the boat and also attached to the headline of trawls. Fry of most species were large enough to elude the plankton nets, and were collected in the trawl. These catches indicated an abundance of alewife, gizzard shad, sheepshead, and yellow perch. White bass fry were exceptionally plentiful with catches of 1,000-4,000 in a 10-minute tow.

Experimental nylon gill nets (mesh sizes 2-, 2½-, 3-, and 4-inch) were set at three stations. All sets were "canned up" so the float line was 6 feet below the surface. A gang set at 5:45 p. m. south-east of Kelly Island and lifted at 11:00 p. m. the same evening caught white bass, yellow pike (walleye), channel catfish, and carp. This net was re-set at 11:30 p. m. and lifted at 11:00 a. m. the following day to gain information on the nocturnal habits of fish. The second lift caught more fish of each species, especially channel catfish, with the appearance of a few alewives and gizzard shad but without any carp.

Surface temperatures in the open lake ranged from 20.8° C. (69.4° F.) to 24.3° C. (75.7° F.). A low of 20.6° C. (69.0° F.) was recorded in Sandusky Bay during the latter part of this cruise. Thermal stratification was observed with the metalimnion just off the bottom in areas as shallow as 9 fathoms.

**WESTERN LAKE SUPERIOR HERRING AND GENERAL FISHERY SURVEY
CONTINUED BY M/V "SISCOWET:"** The fishery and environmental study of Western Lake Superior was continued by the U. S. Bureau of Commercial Fisheries Great Lakes Fishery Investigations.

Cruise 3 (July 21-30, 1958): The three index stations established during cruise 1 were visited during cruise 3 to obtain a midsummer measure of fishery and environmental conditions. These stations are located (1) north of Little Girls Point, Mich., and (2) southeast of Stockton Island, and (3) northeast of Bear Island (two of the Apostle Islands, Wis.). In addition to these, a fourth station was established just northwest of the Porcupine Mountains, Mich.

Fish were collected with gill nets and trawls at each station, and samples were taken for analyses of plankton, bottom fauna, and water chemistry. Bathythermograph casts were made at each station.

Trawl tows were made in very shallow water at depths of 1 to 3 fathoms in an effort to collect fry or fingerling whitefish. Tows made over sandy bottom southeast of Stockton Island caught several menominee whitefish and smelt fingerlings. Even more common in the catch were the slimy muddler, ninespine stickleback, trout-perch, and johnny darters. Tows were made in deeper water at depths of 7-10 fathoms in the same area with essentially the same catch composition. Several tows were made at depths of 3-30 feet with an outboard-powered boat pulling a small trawl in Big Bay on the east side of Madeline Island. Catches consisted of johnny darters, trout-perch, slimy muddlers, and smelt fry. No lake trout were taken in trawl tows during this cruise.

Gill-net catches at the three index stations were similar to the catches made during cruise 1. In water over 20 fathoms chubs dominated the catch. In shallow water at depths of 2-18 fathoms, the menominee whitefish was dominant. A gang, consisting of 7 nets with mesh sizes from 1-3½ inches, set off the southeast shore of Stockton Island in water from 2-13 fathoms made an interesting catch. The smaller meshed nets were set in shallow water with the larger meshed nets in deeper waters. The menominee whitefish was the dominant fish in the 1½-, 2½-, and 3½-inch nets. These fish varied in length from 3-18 inches. Many small (4-8 inch) whitefish were taken in the small mesh nets. Large whitefish, lake trout, longnose suckers, and a few large menominee whitefish were taken in the larger meshes.

Two identical gangs of gill nets were set at the station off the Porcupine Mountains, one at depths from 10-13 fathoms and the other at depths of 47-50 fathoms. The mesh size of the nets varied from 1½-3½ inches. The shallow set (38 fish) caught nigrispinnis (blackfin), burbot, longnose suckers, lake trout, and herring. The deeper catch (168 fish) was much larger with chubs dominating and a few herring.

There was a marked temperature drop between the surface and bottom at each station but sharp thermoclines appeared at stations off Little Girls Point and off the Porcupine Mountains. Surface temperatures at all stations were in the 60's (61.2°-68.0° F.) and bottom temperatures varied from 39.7°-43.5° F.

A newly-established station northwest of the Porcupine Mountains was worked primarily for current determinations. On July 26 and 27 surface and subsurface currents were determined at two stations, one inshore ¼ miles northwest of the shoreline below the Porcupine Mountains and one offshore 2 miles northwest of the Porcupine Mountains. Surface currents at the two stations were determined by using fluorescein dye and specially-designed metal drags that could be followed by attachment to a surface float. Subsurface currents were determined solely by the metal drag technique. On both days the surface current was flowing to the northeast at approximately 0.50 miles an hour. The subsurface current at the inshore station at 50-foot depth was approximately 0.20 miles an hour. At the offshore station the subsurface currents ranged from 0.24 miles an hour at 50 feet to 0.12 miles an hour at 200 feet. Subsurface currents flowed generally in the same direction as surface currents. Currents in the area determined from the geopotential topography also showed the northeasterly drift. One hundred drift bottles were released, 10 at each of 10 stations one mile apart on a line from the shore at the Porcupine Mountains to the northwest. By August 18, 28 cards from these releases had been returned and indicated drift to the northeast at velocities of approximately one-half mile an hour. One bottle was recovered 8 miles east of Marquette, Mich., 190 miles from its release point.

Cruise 4 (August 4-13, 1958): This cruise was the second of four cruises planned to study the distribution of lake herring during the summer and fall. That portion of Lake Superior just outside the Apostle Islands was covered at all depths in search of herring. Areas covered were (1) northwest of Sand Island, (2) northeast of Devil's Island, (3) north of Outer Island, (4) Squaw Bay southwest of Eagle Island, and (5) northwest of Madeline Island in the North Channel. Various types of gill-net sets were made; floating bull nets at 6 feet and 26 feet below the surface, oblique sets with conventional 2½-inch gill nets from the surface to 180 feet, and oblique sets using three bull nets of 2½-inch mesh in the upper portion of the gang and bottom sets with conventional 2½-inch nets. Trawl tows were made where possible at each station.

Trawl tows made at 30 fathoms north of Outer Island caught three species of chubs, pygmy whitefish, and slimy muddlers. Smelt were predominant in the tows made in 5 fathoms at Squaw Bay. Trout-perch, ninespine stickleback, longnose sucker, and menominee were also taken in Squaw Bay. Fish appeared on the fish finder at depths up to 30 feet below the surface in 180 feet of water at one station northeast of Devil's Island. An attempt to capture these fish with the trawl was unsuccessful.

Lake herring were not taken in abundance at any time during the cruise. At the station northwest of Sand Island where herring were taken abundantly during cruise 2, an identical set was made with bull nets but only 26 herring were taken. A few chubs were taken in nets set 26 feet below the surface in 240 feet of water. An oblique set

was made at this station using 3 bull nets at the shallow end of the gang at depths of 0 to 90 feet and conventional nets at depths of 90 to 180 feet. Only 5 herring were taken in this set. Smelt were taken at depths to 45 feet, chubs were taken throughout the entire net, and 1 herring was taken at 165 feet. At Squaw Bay 3 bull nets were floated 6 feet below the surface in water of 8 fathoms. Three conventional nets were set parallel to the shore and 3 nets set perpendicular to shore on the bottom at 36-39 feet. Only 1 herring was taken from the 2 gangs set on the bottom. The bottom set caught 90 menominee whitefish, 21 whitefish, 12

lake trout, and a few smelt and burbot. There appeared to be no difference in the catch in the nets set parallel or perpendicular to shore. The floating bull nets caught mostly smelt, with lesser catches of chubs and longnose suckers.

Fish taken in sets near Outer Island and Madeline Island were predominately chubs and smelt.

Surface temperatures during cruise 4 ranged from 62.2 to 74.8° F. Bottom temperatures remained at about 40° F.



Irradiation Research in Foods

Four leading United States firms in the food and allied industries--Armour & Co., Continental Can Co., Food Machinery & Chemical Corp., and General Food Corp.--have joined forces with the U. S. Army Quartermaster Corps in setting up

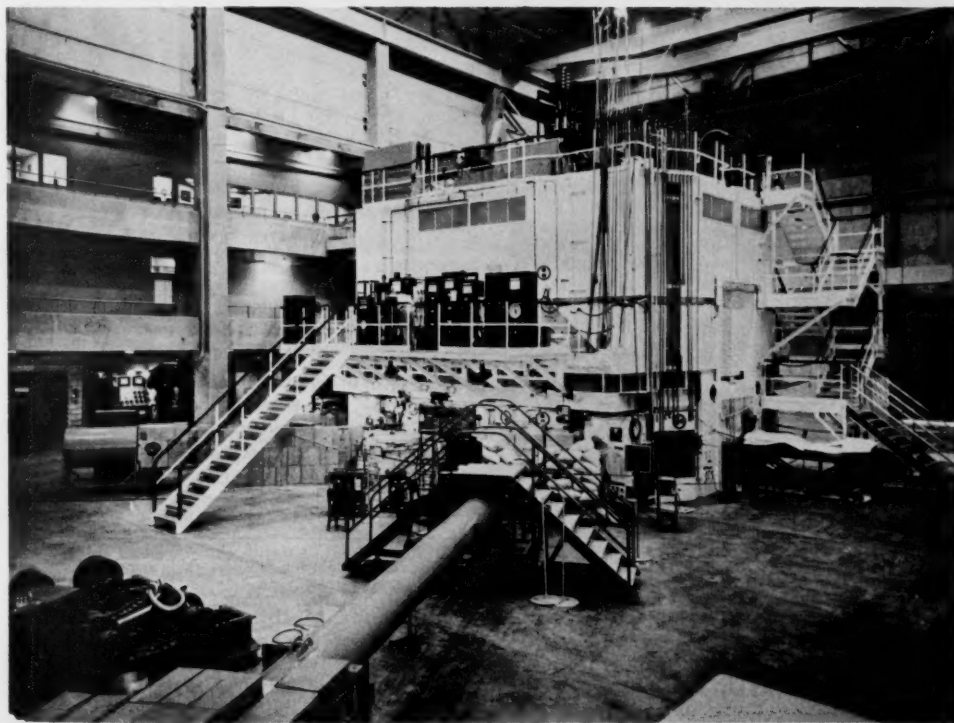


Fig. 1 - Typical gamma reactor used for research purposes.

the world's first food radiation center, it was announced by the Defense Department. This U. S. Army Ionizing Radiation Center (USAIRC), under a contract awarded by the Quartermaster Corps, will be built at Sharpe General Depot, Lathrop, Calif.

In a joint statement explaining their interest in supporting the project, the presidents of the four stockholder companies said:

"We share the conviction that the irradiation of foods opens an important new frontier having significant possibilities not only for the Armed Forces, but for the civilian population as well. We believe that it is important in the national interest that the use of radiation in the handling, processing, packaging, and protecting of food be developed as rapidly as possible, as is proposed by the Quartermaster Corps. Furthermore, we believe that the skills of private industry should be made available for this purpose in cooperation with the Government.

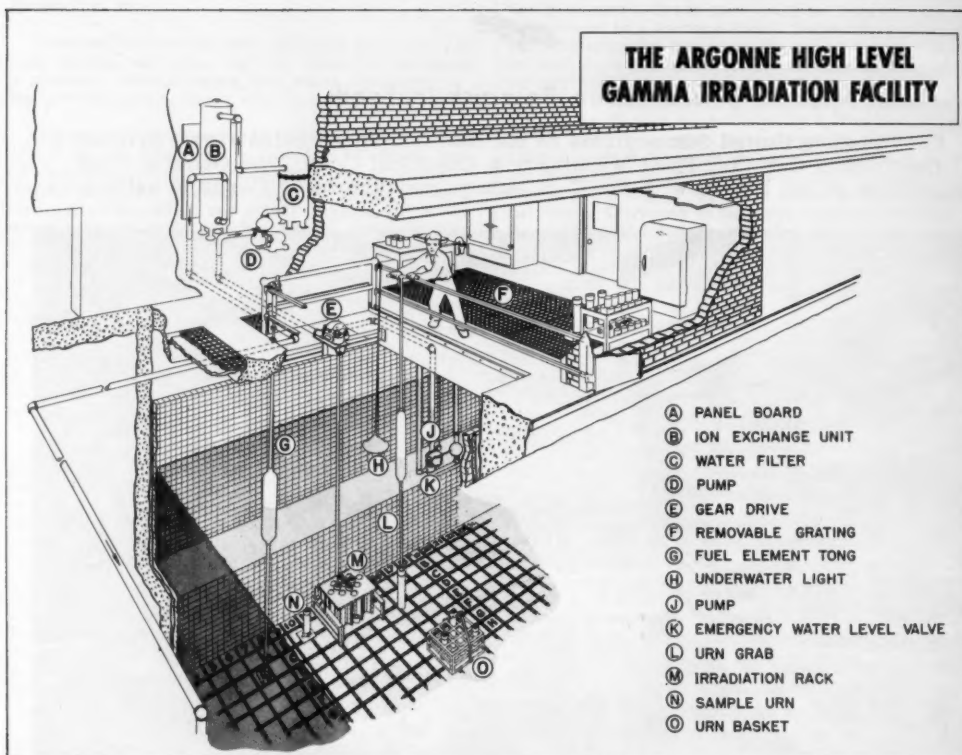


Fig. 2 - Cutaway drawing of Argonne National Laboratory high-level gamma irradiation facility. It is assumed that the one being built at Lathrop, Calif., will be along similar lines.

"Because of our conviction as to the significance of this project and the propriety of private industry sharing its resources of personnel and experience with the Government to carry out the project, we are willing to detach skilled employees from the important work they are now doing for our own companies in order to make them available for employment by IPI."

It is anticipated that approximately 150 employees will be required to operate the center during its first year. Employment in the second year is expected to reach 250.

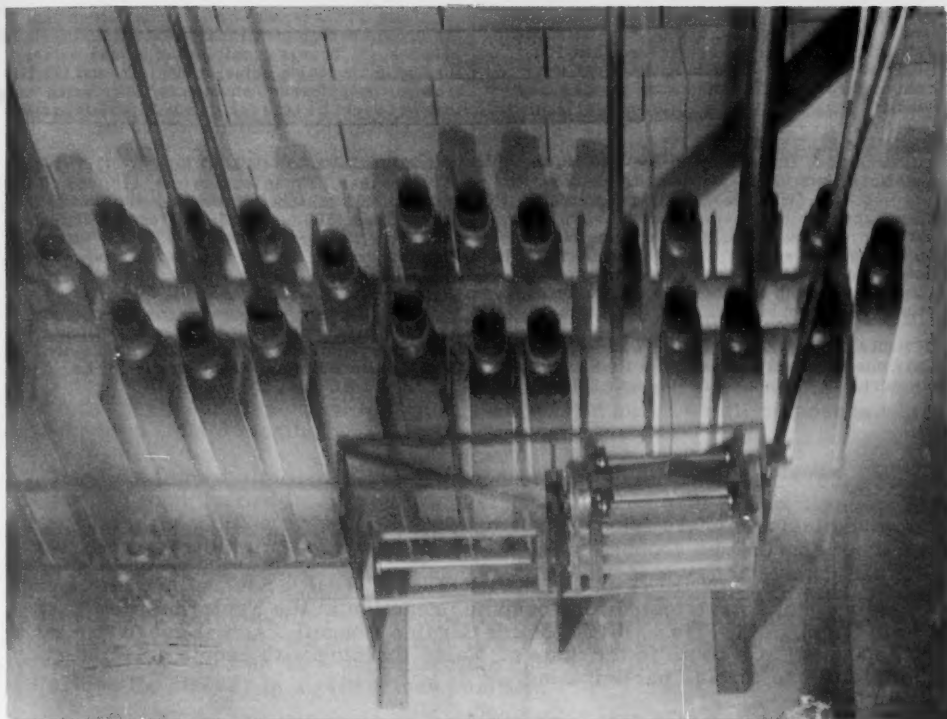


Fig. 3 - View looking down into water-filled canal of Materials Testing Reactor at the National Reactor Station. Cylinder holding can of food being irradiated is on rotating rig in front of gamma-emitting used reactor fuel elements.



Louisiana

SHRIMP REGULATIONS REVISED EFFECTIVE JULY 1, 1958: The Louisiana Wild Life and Fisheries Commission in a notice to shrimp trawlers summarized the new regulations on shrimp fishing in Louisiana waters effective July 1, 1958, as follows:

If you have already obtained a vessel license, it will be necessary for you to apply for a 1958 trawl license for \$10.00, \$15.00, or \$20.00 as indicated below, depending on the size of trawl in use. Be sure to show the length of your trawl as measured along the cork line on the application. Your application must be sent in immediately if you are now trawling in outside waters.

If you do not trawl in outside waters, your application must be sent in and license obtained before you begin operations. Inside waters will be open starting August 18, 1958.

Please observe these regulations carefully. The penalty has been increased in order to preserve the shrimp in Louisiana waters. Penalties for viola-

tions will be as follows: (1) Illegal, unlicensed, or improperly-tagged tackle shall be confiscated and destroyed. (2) First Offense: \$200 minimum fine, \$500 maximum fine or 15-30 days in jail, or both. (3) Second Offense: \$500 minimum fine, \$1,000 maximum fine and 60-90 days in jail. (4) Third Offense: \$750 minimum fine, \$1,000 maximum fine and 90-120 days in jail, and the license shall be revoked and shall not be reinstated at any time during the period for which it has been issued and for one year thereafter.

Shrimp Regulations (as per House Bill No. 572):
LENGTH OF TRAWL: Netting along cork line--50 feet maximum inside waters.

OUTSIDE WATERS: (a) 3 miles beyond Continental Coast Line; and (b) except Cameron Parish, which will be the Shore Line.

CLOSED SEASON: (1) December 21 through April 20, inclusive; and (2) July 1 to third Monday in August.

DURING CLOSED SEASON: (1) All trawls prohibited from inside waters; and (2) cast nets, dip nets, bait traps, or shrimp seines less than 100 feet may be used. (To be manually operated on foot only. No mechanical means or devices may be used).

MINIMUM SIZE COUNTS: (1) May 1-June 30: No minimum size limitation; (2) 3rd Monday in August-November 14: 68 count on all species; (3) November 15-December 20: 68 count on all species, except no minimum count on brown or Brazilians; (4) Sea Bobs: No minimum size limitation during open season; and (5) Bait Shrimp: No minimum size limitation during open or closed seasons if taken with cast net, dip net, bait traps, or seine 100 feet or less.

GENERAL TRAWL AND SEINE RESTRICTIONS: (1) Only one trawl may be used at a time in inside waters; (2) Maximum trawl length, 50 feet;

(3) Mesh, $\frac{1}{4}$ inch square or $1\frac{1}{2}$ inches stretched; (4) Trawls prohibited in inside waters during closed seasons; (5) Trawls prohibited in closed waters; (6) Maximum length seine, 3,000 feet; and (7) No trawl or boat license required for sportsmen using trawls 16 feet or less for own bait purposes and consumption only. Maximum of 100 lbs.

LICENSE FEES: COMMERCIAL (1) Trawls: 16 feet or less, \$10; 16 feet-40 feet, \$15; and 40 feet-50 feet, \$20. (2) Shrimp Seines: 100 feet or less, \$10; 100 feet-500 feet, \$15; 500 feet-2,000 feet, \$25; and 2,000 feet-3,000 feet, \$30. (3) Vessel: Fish or Shrimp: 40 feet or less, \$5; and over 40, \$10. (4) Shrimp Freight Vessel: 40 feet or less, \$5; and over 40 feet, \$10.

Further information may be obtained from the Louisiana Wild Life & Fisheries Commission, 126 Civil Courts Building, New Orleans 16, La.



Maine Sardines

NEW-STYLE CANNED PACKS EXHIBITED AT FAIR: Several new-style canned sardine packs were tested for consumer reaction at the Eastern States Exposition in Springfield, Mass., by the Maine Sardine Council. Actual consumer tests were conducted at a booth in the State of Maine Building with people selected at random from the crowds participating.

The Council is seeking facts on consumer acceptability of experimental packs of sardines in a variety of different flavored oils and sauces as compared with the present standard-style packs. Those that show promise will be market-tested in the hopes of expanding the State's sardine sales.

The tests were conducted in the Maine Department of Sea and Shore Fisheries exhibit under the direction of a New Products Specialist and a Merchandising Specialist, both of the Council's staff.

Participants were served the sardines and a careful record of reactions and comments maintained for evaluation of the tests. An effort was made to select a good cross-section of people of all ages, nationalities, income levels, occupations, and other factors.



Massachusetts

JULY-AUGUST 1958 BOSTON LANDINGS LOWEST IN 36 YEARS: Total landings of fish at the Boston Fish Pier during July-August 1958 were the lowest since 1922. A haddock shortage on Georges Bank was added to the old ills of Boston's fishing industry--fewer vessels, continually increasing operating expenses, and foreign competition. Prospects are not bright for the immediate future and it is estimated that 1958 landings at Boston will fall below the already low level of 1957.

Landings at the Fish Pier in July-August 1958 totaled only 19.9 million pounds for the two months, the lowest summer landings since 1922. In that summer landings

totaled 18.1 million pounds, but then Boston's fishing industry was still undergoing the transition from the less efficient line vessel to the more productive otter trawler. Much progress has been made in the Nation's economy in these past 36 years, but the Boston Fish Pier landings have gradually declined from a peak of 339.2 million pounds in 1936 to the 1957 level of 135.6 million pounds.

The light landings at Boston this summer caused higher ex-vessel prices. The total value received by vessel owners and fishermen was higher than in the past few years, but hardly sufficient to keep pace with increased operating and living expenses.

For both summer months this year landings were poor--the July total was only 9.8 million pounds and August 10.1 million pounds. Ten years ago in 1948, the total was 36.2 million pounds. Record landings for the two months were 62.1 million pounds in 1936. The total in 1957 was 25.8 million pounds.

For the first eight months of 1958 fishery landings at Boston amounted to only 91.8 million pounds, 6 percent less than last year when 97.4 million pounds were landed in the first 8 months.

Haddock is now almost the sole support of the Boston Fish Pier--only 12.3 million pounds were landed in July and August as compared with 19.3 million pounds, in the same two months of 1957. Bureau of Commercial Fisheries biologists at Woods Hole have been for many years studying the haddock on Georges Bank where the bulk of Boston's haddock originates. In a recent release, they reported "The stocks of Georges Bank haddock have been fished down to the point where the catches depend upon large numbers of comparatively small fish. . . . In terms of age, the fishery was once supported in large part by fish 5-9 years old but in recent years 2-4 year-old fish have dominated the catches. The depletion of large fish has placed the fishery in a precarious position."

--John J. O'Brien, Supervisory Market News Reporter,
Branch of Market News, Division of Industrial Research and Services,
U. S. Bureau of Commercial Fisheries, Boston, Mass.



National Fish Week

FISH PROMOTION CAMPAIGN AIDED BY INTERIOR DEPARTMENT: An industry-government program to direct the attention of the consumer to the uses of fresh and frozen fishery products this fall will again have the support of the U. S. Bureau of Commercial Fisheries, Assistant Secretary of the Interior Ross Leffler announced on September 12, 1958.

This nationwide program, titled "National Fish 'n' Seafood Parade," will be aimed at both institutional and home-consumer markets and will have its climax during October 6-12.

The Assistant Secretary said that the Bureau will aid the industry effort with schools, institutions, and food-trade groups. Educational activities will be increased to stimulate consumer response.

* * * * *

FISHING INDUSTRY PROMOTES FISH AND SEAFOOD WEEK: The national campaign of advertising and publicity for Fish and Seafood Week, October 6-12, was in full swing by that date. Local committees in every section of the country had

laid the groundwork for food stores and restaurants to feature fish and shellfish during the promotion.

According to the Chairman of the National Committee, the interest of the fishing industry and the food trade in the 1958 Fish & Seafood Week (more popularly known as Fish 'n' Seafood Parade) was far beyond expectations, and the nationwide interest was reflected in chain stores everywhere.

As an illustration of local activities, the Philadelphia committee of fishing industry and food store members held a luncheon at the famous Bookbinders Restaurant on September 12 for food editors. This was followed by similar activities throughout the country culminating with a dinner in Boston on October 2, at which time "Miss Seafood of 1958" was selected for the Commonwealth of Massachusetts.

A large fishery firm advised the National Committee in mid-September that they were insuring their dealers for \$5,000 during the Fish & Seafood Week to protect them from being trampled to death by customers who were expected to buy their products.

* * * * *

FISH WEEK SUPPORTED BY WHITE HOUSE: On September 11, President Dwight D. Eisenhower sent the following message to the National Fish and Seafood Committee:

"The White House, Washington, D. C., Sept. 11

"F. M. Bundy, Chairman, National Fish and Seafood Week Committee, 1514 Twentieth St. NW., Washington, D. C.

"The Fishing Industry has long played a vital part in the life and economy of our Nation. As our population continues to grow and as our land becomes more fully utilized, we will turn to the sea for more and more of the nutritive food requirements needed to maintain our American standard of living.

"During National Fish and Seafood Week, I salute the members of this industry for a job well done and urge them to utilize every possible means of making their products available as an increasingly attractive and abundant food for every American family."

/s/ "Dwight D. Eisenhower"



North Atlantic Fisheries and Gear Research

SAFETY PROGRAM AND GEAR RESEARCH STUDIES (M/V Delaware Cruise 58-4): A combined safety and gear research four-day cruise to the South Channel-Western Georges Bank area was made by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware. The cruise ended on August 28, 1958.

Representatives of a New York firm, engaged in the current fisheries safety program, accompanied the boat and snapped over 100 photographs depicting various phases of otter-trawl fishing and operating equipment.

Tests were completed of the new double-barrelled winch head, pilothouse-operated main engine throttle control, aluminum radar target, plastic floats, and towing characteristics of trawls equipped with 3" and 4½" stretched mesh size

cod ends. Lookout watches for tuna schools were maintained during daylight hours.

The new winch head worked perfectly when operated with the messenger wire to lead the trawling cables to the towing block. Leading directly from the after fair-



Fig. 1 - Safety equipment demonstration was conducted on the dock and aboard the exploratory fishing vessel Delaware in mid-August before this cruise.

lead to the winch head, the messenger was hooked over the drum holding-stud, enabling the winch operator to control the speed and draw the wire smoothly and evenly up to the towing block. The fish tackle, used to hoist bags of fish up to 5,000 pounds, can also be operated from this drum, precluding manual handling of wires entailing two hazardous operations.

While presently adapted for reversible trawl winches, it appears that only slight modifications in design are needed to allow the device to be fitted on all types of winches.

The main engine throttle control was thoroughly tested for emergency stops during normal cruising runs and under actual fishing conditions. Almost instantaneous action resulted when the pilothouse lever was actuated. In addition to the safety aspect, this device could prove extremely valuable in

trawl net hang-ups on bottom obstructions when prompt action in slowing the vessel's headway could avert excessive damage to the net.

The aluminum radar target was attached at a height of 12 feet above the water to a bamboo staff while radar visibility tests were conducted. Results indicate that this target would be extremely valuable for marking fishing buoys and for small wooden craft during periods of low visibility. Conventional fishing buoys, with cloth markers, cannot be picked up on the radar scope.

Submersion tests of a plastic-type float were made by securing the float to the trawl net head rope during fishing tows conducted in depths ranging from 51 to 96 fathoms. The float presented no exterior change in appearance during the tows in the upper depths, but was compressed considerably when subjected to pressures found in the depths below 57 fathoms. Results indicate that the float is suitable for pelagic fishing gear and has a relatively limited depth range.

With the exception of a few small pods of tuna, sighted about 25 miles southeast of Cape Cod Light during the homeward passage on August 28, no tuna schools were found during the trip. Rainy weather prevailed most of the time--not conducive to tuna spotting.



North Atlantic Fisheries Investigations

VERTICAL DISTRIBUTION OF POST-LARVAL OCEAN PERCH IN GULF OF MAINE STUDIED (M/V Albatross III Cruise 116): Fifty-two tows were made at 11 stations in the southwest part of the Gulf of Maine with the Isaacs-Kidd mid-water trawl. This cruise (completed August 1, 1958) of the U. S. Bureau of Commercial Fisheries research vessel Albatross III was made to investigate the vertical distribution of post larval ocean perch and other associated species in the Gulf of Maine.

Depths from 10 meters to 80 meters were sampled at 10-meter intervals. A few tows were made with a one-meter plankton net. A bathythermograph drop was made at each station.

Very few postlarval ocean perch were found, about 2 percent of the numbers taken at similar stations last year. Extremely large numbers of young-of-the-year haddock were taken, some at every station, with concentrations at 10 and 20 meters. The haddock were at least 10 times as numerous as at the same stations last year. The evidence is strong enough to suggest the presence of a very good year-class from the 1958 spawning.



North Pacific Exploratory Fishery Program

EXPLORATORY FISHING FOR SHRIMP OFF ALASKAN COAST (M/V John N. Cobb Cruise 39): Pink cocktail-size shrimp and larger varieties such as sidestripe and coonstripe were reported abundant in the bays and inlets of Kodiak Island, Lower Cook Inlet, and along the southeast side of Kenai Peninsula by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel John N. Cobb, during an exploratory cruise which ended September 5, 1958.



Fig. 1 - Landing a catch of 700 pounds of shrimp aboard the exploratory fishing vessel John N. Cobb in Nuka Passage, Kenai Peninsula, Alaska.

Best catches in the Lower Cook Inlet area were in Kachemak Bay which yielded shrimp at rates of 1,480 to 3,540 pounds an hour. These catches were composed of pink shrimp averaging 150 to the pound (all counts heads on) and a good quantity of large sidestripe and coonstripe shrimp ranging from 27 to 53 to the pound. Other good catches made in the Cook Inlet-Kenai Peninsula area were as follows:

Cape Douglas: Up to 1,200 pounds an hour of mixed shrimp, mostly pinks averaging 112 count.

Nuka Passage: Catches up to 1,560 pounds an hour composed of about 50 percent pinks ranging from 80 to 96 count, 40 percent sidestripes from 44 to 68 count, and 10 percent coonstripes from 20 to 27 count.

Nuka Bay: Catches at rates up to 900 pounds an hour consisting predominately of pink and sidestripe shrimp ranging from 67 to 109 and 23 to 59 count, respectively.

Port Dick: Catches at rates to 1,440 pounds an hour. Pink shrimp, which dominated these catches, ranged from 75 to 93 count, while sidestripes averaged 47 count.

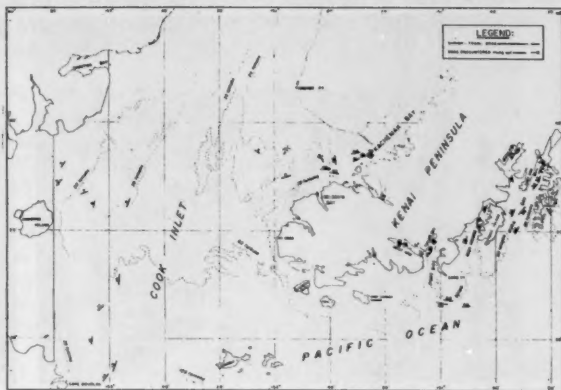
During the last half of the cruise explorations were conducted in the bays, inlets, and offshore waters surrounding Kodiak Island. Excellent catches were made in Marmot Bay, Izhut Bay, Kukak Bay, Raspberry Strait, Uganik Bay, and Alitak Bay as follows:

Marmot Bay: Catches at rates to 2,800 pounds an hour of pink and sidestripe shrimp. The pinks were relatively large, running 59 to 172 count. Sidestripes in these catches ranged from 23 to 51 per pound.

Outer Izhut Bay: Catches at rates up to 2,600 pounds an hour, predominantly pinks, ranging from 134 to 172 count.

Kukak Bay: A catch of 950 pounds of mixed shrimp in a 34-minute tow was composed of approximately half pinks and half sidestripes with counts of 117 and 32, respectively.

Uganik Bay: One 30-minute tow yielded 1,000 pounds of pink shrimp averaging 117 count.



M/V John N. Cobb cruise 39 (July-August 1958).

Alitak Bay: Catches at rates to 1,800 pounds an hour of pinks, sidestripe, and coonstripe shrimp. The average size of pinks was 118 to the pound, while the sidestripes and coonstripes averaged 41 and 63 count, respectively.



M/V John N. Cobb cruise 39 (August-September 1958).

Raspberry Strait: A 30-minute tow yielded 650 pounds of pink shrimp averaging 115 count.

Shelikof Strait: Best catches were made between Shuyak Island and Cape Douglas. Sidestripe and pink shrimp, averaging 50 to 67 count, respectively, were taken at rates to 600 pounds an hour.

Catches made during the explorations demonstrated that large concentrations of shrimp are available in Central Alaskan waters. Good catches of larger shrimp were taken in contrast to the shrimp grounds off Washington and Oregon, which yield only small pink shrimp.

A total of 109 shrimp drags was made during the explorations, at depths ranging from about 15 to 150 fathoms. Most drags were 30 minutes with a 43-foot Gulf-of-Mexico shrimp trawl; however, a 70-foot shrimp trawl was used occasionally.

The shrimp exploration was the fourth to be conducted by the Bureau of Commercial Fisheries

in 1958; three previous cruises were conducted offshore from the Washington and Oregon coasts earlier this year.



Fig. 2 - Spilling catch of shrimp on sorting table on deck of John N. Cobb in Lower Cook Inlet, Alaska.

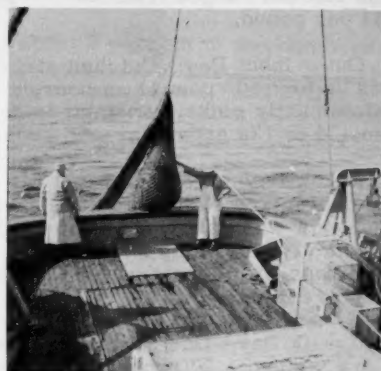


Fig. 3 - Cod end of shrimp trawl on the John N. Cobb with catch of shrimp from Marmot Bay, Kodiak Island, Alaska.

In addition to routine exploratory work, samples of shrimp and fish were collected for biological and technological study. Oceanographic and meteorological data were recorded throughout the cruise.



Oysters

JOINT RESEARCH PROGRAM ON STANDARDS: Three participants--Oyster Institute of North America, U. S. Food and Drug Administration, and the U. S. Bureau of Commercial Fisheries--have agreed to a joint research program to develop standards for oysters.

The oyster industry through the Institute agreed to bear its share of the cost of the studies and to serve on a joint Committee of three to follow through on the program.

Under this program all data available will be pooled and the entire work will be under the direction of one outstanding scientist appointed jointly by the participants. A Steering Committee of three persons--one from each organization--has been appointed to select a director, obtain a site for the work, and develop the aims of the study and the projects to be studied. The Committee is composed of Charles Butler, Chief, Branch of Technology, U. S. Bureau of Commercial Fisheries; Jonas L. Basen, Asst. Chief, Program Planning and Review of the U. S. Food and Drug Administration, and David H. Wallace designated as the industry representative.



Pacific Oceanic Fishery Investigations

ALBACORE TUNA SURVEY IN CENTRAL NORTH PACIFIC COMPLETED: (M/V Hugh M. Smith Cruise 46): The return of the U. S. Bureau of Commercial Fisheries research vessel Hugh M. Smith to Honolulu on September 9, 1958, from a 51-day cruise to the central North Pacific brought the Pacific Oceanic Fishery Investigations (POFI) study of the distribution and abundance of albacore tuna to a

close for the current season. The other vessel which participated in the survey, the M/V Paragon, had returned to Seattle on September 7. The Hugh M. Smith was primarily engaged in the collection of oceanographic and biological data while the Paragon was engaged in an actual attempt to determine whether the albacore were sufficiently abundant for gill-netting on a commercial scale.

The results of the survey were disappointing from the standpoint of the area's potential as a commercial fishery, especially after the promising results of surveys during the summers of 1955 and 1956. The catch of the Paragon was very small, averaging less than one-half ton a day. There were only one or two small areas where the catches approached commercial quantities.

The biological and oceanographic studies provided some explanation as to the decline of fish. The environmental conditions were vastly different from those of 1955 and 1956. The most prominent of these differences was the lower surface water temperatures in the area which resulted in a southerly shift in the area having a suitable temperature for albacore.

The Paragon chartered to test the commercial feasibility of gill-netting albacore in mid-ocean, began gill-netting operations on July 27, 1958, at 41°42' N. latitude and 157°10' W. longitude, or roughly 1,800 miles west of southern Oregon. The gill-netting for albacore was continued through August in an area between 155° and 160° W. longitude, and a disappointing total of some 15 tons of fish was taken.

Catches of albacore made by salmon gill-netters which fished along the northern border of albacore water during 1955 were impressive. The survey conducted by POFI in 1956 and in the same general area again showed good results, particularly along 175° W. longitude. However, these earlier indications of the presence of large concentrations of albacore were at variance with the relatively poor catches during August of the Paragon. Obviously albacore were not in this area in the same abundance as was true of the previous years when surveys were made. Oceanographic conditions were also unusual and this may be the explanation of the poorer than expected catches. This year the general distribution of albacore in the North Pacific seems to have changed. Independent evidence of this is available from the localities where the best albacore catches are now being made along the Pacific coast. In general the coastal catch localities of good fishing have shifted northward.

* * * * *

NEW DOCKSITE FACILITY OPENED: The Pacific Oceanic Fishery Investigations of the U. S. Bureau of Commercial Fisheries and the Hawaiian Board of



POFI's new docksite facilities under construction at Kewalo Basin.

Agriculture and Forestry formally opened their new \$70,000 Kewalo Basin docksite facility August 11 with dedication ceremonies and a public open house. There were about 20 scientific and fishing exhibits on bait fish, deep-sea fish, skipjack (aku) research, oceanography, tuna behavior, and fishing methods.

Built by the Territorial Board of Harbor Commissioners, the docksite is located on the small peninsula of land on the Diamond Head side of the Kewalo Basin channel entrance on the Island of Hawaii. Work was started early this year and installation of fish tanks was about completed the first part of September.

Three research vessels will moor alongside the new facility: the Charles H. Gilbert and Hugh M. Smith of the Bureau's Pacific Oceanic Fishery Investigations, and the Hawaiian Fish and Game research vessel Makua.

Previously, the Bureau's vessels were docked at Pearl Harbor and the Makua at Pier 12. The new docksite puts the Bureau's Investigations and the Territory Division of Fish and Game in the center of island commercial fishing activities and close to areas for tuna behavior studies. The move also eases the coordination of scientific projects between the two agencies.

The Bureau's Investigations has offices, a scientific laboratory, electronics laboratory, net loft, machine shop, and warehouse in the new building while the Territory of Hawaii has offices, laboratory, and storage space.



Sport Fishing

PROGRAM FOR IMPROVING SPORT FISHING: A program designed to help meet the need for improved recreational opportunities in the form of sport fishing is being given impetus by the U. S. Fish and Wildlife Service.

The program, conducted by the Bureau of Sport Fisheries and Wildlife, consists of helping other Federal agencies develop better fishing through the use of better management methods, rendering technical assistance to states and public conservation agencies when such assistance is needed, and in cooperating with states in fish restoration projects where a pooling of efforts is especially beneficial.

The Service recognizes at the outset that the regulation of sport fishing is primarily a responsibility of the states and that Federal effort is designed to complement that of the states and to help make available information gained from research and experience.

Among the numerous things about which fishery management is concerned are: aquatic weed control techniques; stocking with the proper numbers and species of fish to fit water conditions; proper methods of fertilization; eradication of trash fish or the reestablishment of a proper ratio between game and forage fish; and recognition of common danger signals on such things as fish population imbalance, evidence of disease, and pollution.

Management biologists assist in the formulation of cooperative fish-stocking programs and have a continuing responsibility to insure the best possi-

ble use of fish produced at the Federal hatcheries. It is extremely important that all efforts, both in hatcheries and in the field, contribute materially to fish restoration and better fishing.

A large part of the fishery assistance effort is directed at such Federal installations as the Veterans' Administration hospitals where fishing has a therapeutic value in convalescence; military installations where it serves recreational functions; national parks and forests where fishing vacations are popular; and Indian reservations where both fishing and the sale of fishing permits have an economic meaning.

Statistics for 1957 show that technical advice was given in 137 such areas, including 40 Air Force bases. Eglin Air Force Base, Fla., for example, has developed an outstanding cooperative sport fishing program. In addition to preexisting ponds and streams, 12 new ponds have been created and managed for fishing under carefully prepared plans. The public is allowed to fish upon payment of a small permit fee and the receipts from such fees go to support and enlarge the program.

Somewhat similar services were rendered at 33 Army bases including Ft. Sill, Okla., where there are 52 ponds; and at 16 Navy and 4 Marine Corps installations. Numbers of other Federal areas upon which recommendations on managing the fisheries have been made include: Veterans' Administration, 8; national forests, 7; national parks, 4; Indian reservations, 13; and national wildlife refuges, 12. Such public conservation agencies as the Upper Mississippi River Conservation Commit-

tee and the Steering Committee for Roanoke River Studies also were given certain technical assistance.

Farm pond demonstrations were given in Arkansas, North Carolina, New Hampshire, and Ohio.

Among the state-Federal cooperative programs is one in Kentucky involving a study on the effects of strip-mining on streams and the plant and animal life normally supported by streams.



Swordfish

EVIDENCE THAT BROADBILL MAY BE WIDE-RANGING: Another indication that the broadbill swordfish may be as wide-ranging a fish as any in the ocean has been noted by California Department of Fish and Game biologists at Terminal Island. A long-line hook, used by Japanese fishermen, was recovered by a California commercial fisherman July 17 off Santa Cruz Island. The hook was imbedded in the jaw of a 350-pound broadbill caught by a fisherman from Corona Del Mar.

California biologists say the hook, about a size 8-0, can tell them almost as much as a tag recovery can. The unique gear appears to be hand-forged and is definitely the type used by Japanese west of Hawaii and in the long-line fishery around Wake and Midway Islands. The fish apparently had been hooked by a Japanese fisherman but escaped by breaking the line. (News release of August 22 from the California Department of Fish and Game.)



Tuna

TAG RETURNS REVEAL MIGRATION OF ALBACORE IN PACIFIC: Two more albacore tuna, tagged by the California Department of Fish and Game, have spanned the vast Pacific to shed new light on a life history once thought impossible to record. These fish traveled several thousand nautical miles to participate in the ocean fishery of two great continents. California marine biologists tagged them near the California coast, one in September 1956 and one in July 1957. Both were caught off Japan in June 1958 and their tags returned to the California Department by Japanese fisheries agencies.

For many years, fisheries workers believed that the albacore resource in the North Pacific was made up of three main populations—one that lived along the west coasts of Baja California and the United States, another near the Hawaiian Islands, and a third off the coast of Japan. Conclusive proof of this theory was difficult to obtain, but feelings on the matter were pretty firm.

Then in 1952, marine biologists developed a tag with such tremendous staying qualities that for the first time in research history it became possible to study the migratory habits of the mysterious oceanic albacore. California biologists began to use these tags during 1952 and early returns revealed the first of the albacore's well-kept secrets—during the summer and fall it migrated northward from southern Baja California and swam on up the California coast.

As it had during previous years, the coming of winter marked the disappearance of the schools from California waters and the end of the fishery for another season. Where they had gone was anyone's guess.

This riddle remained unsolved until June 23, 1953, when a Japanese fisherman captured one of California's tagged albacore in the waters near Japan. This history-making occasion blazed the trail for a whole new trend of thinking regarding North Pacific albacore stocks. One transpacific recovery, however, did not constitute positive proof that there was free mixing between the California and Japanese populations. Neither did it prove that Pacific albacore had usurped, from the Atlantic eels, the title for the lengthiest migration ever known in the fish world.

In 1954, two additional tagged albacore were recaptured near the Hawaiian Islands, demonstrating an even more closely knit relationship. Now for the first time, a close association had been found between the California stocks and those fished in the central Pacific.

Subsequent tagging has shed further light on these interrelationships.

By July 1958, a total of five albacore, tagged in California's coastal fishery, had traversed this planet's greatest ocean and been recaptured in the Japanese coastal fishery, and two had been recovered near the Hawaiian Islands. In addition, 17 albacore had been recaptured on our coast one and two years after they had been tagged and released here, further pointing up theories that had been thought unprovable, that these Pacific wanderers will visit California during several successive seasons. (California Department of Fish and Game news release, August 15, 1958.)



U. S. Foreign Trade

GROUND FISH FILLET IMPORTS, AUGUST 1958: During August 1958, imports of groundfish and ocean perch fillets and blocks amounted to 13.5 million pounds. Compared with the same month of 1957, this was a drop of 1.1 million pounds or 7 percent.

Canada continued to lead all other countries with 10.1 million pounds or 74 percent of the month's total imports. Iceland was second with over 2.5 million pounds or 19 percent of the total. Imports from Denmark, West Germany, Miquelon and St. Pierre, the United Kingdom, Norway, and the Netherlands made up the remaining 926,000 pounds or 7 percent.

During the first eight months of 1958, imports of groundfish and ocean perch fillets and blocks amounted to 100.0 million pounds--3.6 million pounds or 4 percent above the quantity imported during the same period of 1957. Imports from Canada represented 71 percent of the 1958 eight-months total. Iceland accounted for 16 percent, Denmark 8 percent, and the remaining 5 percent came from eight other countries.

Note: See Chart 7 in this issue.

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EDIBLE FISHERY PRODUCTS, MAY 1958: Imports of edible fresh, frozen, and processed fish and shellfish into the United States during May 1958 were up 9.8 percent in quantity and 14.4 percent in value as compared with April 1958. The increase

Item	Quantity			Value		
	May		Year	May		Year
	1958	1957	1957	1958	1957	1957
Imports:	(Millions of Lbs.)			(Millions of \$)		
Fish & shellfish:						
Fresh, frozen & processed ^{1/}	72.4	59.3	837.0	22.3	20.4	248.4
Exports:						
Fish & shellfish:						
Processed only ^{1/} (excluding fresh & frozen)	1.4	5.5	69.7	0.3	1.0	16.8

^{1/} Includes pastes, sauces, clam chowder and juice, and other specialties.

was principally due to more imports of frozen groundfish and other fillets, shrimp, sardines canned in oil, fresh and frozen sea scallops, canned and frozen spiny lobsters, and canned tuna in brine.

Compared with May 1957, the imports this

May were higher by 22.0 percent in quantity and 9.3 percent in value because of more arrivals of frozen groundfish and other fillets, canned sardines, canned salmon, frozen shrimp, frozen tuna, and canned tuna in brine.

United States exports of processed fish and shellfish in May were up 7.7 percent in quantity and unchanged in value as compared with the preceding months. Compared with the same month in 1957, the exports in May 1958 were lower by 74.5 percent in quantity and 70.0 percent in value, due primarily to below-normal packs of California sardines, mackerel, and anchovies which curtailed the export of these products.

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IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

The quantity of tuna canned in brine which may be imported into the United States during the calendar year 1958 at the 12-1/2 percent rate of duty has been established as 44,693,874 pounds. Any imports in excess of this established quota will be dutiable at 25 percent ad valorem.

Imports from January 1-August 2, 1958, amounted to 26,636,243 pounds, according to data compiled by the Bureau of Customs. This leaves a balance of 18,057,631 pounds of the quota which may be imported during the balance of 1958 at the 12-1/2 percent rate of duty. Last year from January 1-August 3 a total of 22,518,460 pounds had been imported.

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IMPORTS AND EXPORTS OF SELECTED FISHERY PRODUCTS, JANUARY-JUNE 1958: Imports: GROUND-FISH FILLETS AND BLOCKS:

Imports of these products for the first half of 1958 were 1 percent higher than during the similar 1957 period. Imports of cod fillets were up 9 percent owing to greater receipts from Canada and Denmark, whereas imports of haddock, hake, pollock, and cusk fillets declined by 14 percent due to lower receipts from Norway and Canada. Imports of ocean perch fillets were 2 percent greater; increases in shipments from Canada more than made up for a sizable decline from Iceland. Imports of blocks or slabs increased by 5 percent with larger receipts of Danish products offsetting reduced Canadian shipments.

FISH BITS: Available data on blocks of bits and pieces of groundfish fillets showed almost 5 million pounds imported from Iceland during the first six months of 1958. During June, imports totaled 3.1 million pounds.

FROZEN TUNA: Imports for the first half of 1958 were 14 percent over the same 1957 period. Receipts in June of frozen yellowfin and skipjack from Japan more than doubled, whereas receipts from Peru were slightly less than half. Imports of albacore tuna were 18 percent less than during the first half of 1957.

TUNA LOINS AND DISCS: Reflecting the voluntary restrictive measures imposed by the Japanese, imports January-June 1958 declined 53 percent from the similar 1957 period. However, trade reports from Japan indicate that exports to the United States may be resumed sometime in October 1958. Exports, under a check-price system, up to 3,000 short tons will probably be scheduled from October 1958 to April 1959. Imports of tuna loins and discs from Cuba continued to rise during June.

CANNED TUNA: For the first six months of 1958 imports were 5 percent above those of the comparable 1957 period. Larger imports of canned tuna, other than albacore, were responsible for the increase and also compensated for reduced imports of canned albacore. The six-months total for canned albacore imports was 27 percent less than in the similar 1957 period; the decrease was partly due to reduced summer albacore catches by Japan.

CANNED BONITO: Despite increased June receipts, imports from Peru for the first half of 1958 were 17 percent below the first half of 1957, principally due to a decline in brine-packed imports.

FRESH AND FROZEN LOBSTERS: Imports for the first half of 1958 were 4 percent less than for the first six months of 1957.

FRESH AND FROZEN SHRIMP: The continuing gains in shipments from Hong Kong, in particular, and Ecuador offset declines from Japan and Panama. Total January to June imports were 11 percent above a year ago.

CANNED OYSTERS: Owing to greatly increased receipts from Japan, imports during the first half of 1958 rose 100 percent over those of the same 1957 period.

CANNED SARDINES: A 13-percent drop in imports of sardines canned-in-oil during January-June 1958 was due mainly to a decline in receipts from Norway, the principal supplier. Imports of sardines not-in-oil in the same 1958 period were up 600 percent due mainly to the large gain in shipments from the Union of South Africa.

CANNED SALMON: Large shipments of canned salmon in June 1958 from Japan and Canada raised total imports. During the first six months of 1958 to almost three times those of the same 1957 period.

CANNED CRABMEAT: Imports for the first half of 1958 were 9 percent below the same period of 1957.

FISH MEAL: Imports for the first half of 1958 were 16 percent above the 1957 period. Increased receipts from Angola, Peru, Chile, and the Union of South Africa more than offset the sharp decrease in receipts from Canada.

Exports: CANNED SARDINES, MACKEREL, AND SARDINES: Exports of these products January-July 1958 continued below those of last year. Declines reported were as follows: canned sardines, 60 percent; canned mackerel, 88 percent; and canned anchovies, 90 percent. The drop in exports was due to the light pack because of the scarcity of fish.

CANNED SALMON: June exports were greater than those of June 1957, but the half-year total was still 42 percent less than for the same 1957 period.

FISH OIL: The total of fish-oil exports for the first six months of 1958 were 45 percent below those of the same 1957 period. The large gain in shipments to Canada were not enough to offset sharp declines in shipments to West Germany and the Netherlands.

**Virginia**

CRAB KILLS CAUSED BY LACK OF OXYGEN: A high mortality of crabs in pots this summer hurt Virginia's crab industry. Biologists at the Virginia Fisheries Laboratory at Gloucester Point say that the kills have been caused by lack of oxygen in the water.

A member of the Laboratory's staff stated that crabs, oysters, fishes, and other aquatic animals, just like animals on land, need oxygen to breathe, but that their

oxygen had to be obtained from the water. In summer, the deeper waters of Chesapeake Bay and the lower parts of some of the larger rivers become almost stagnant, and the oxygen dissolved in these waters is used up rapidly by animals and bacteria. It is thought that this summer the situation was worse than ever before.

Three things have combined to produce unusually serious conditions this year, according to the Laboratory Director. He stated that (1) unusually heavy rains brought more organic material than usual down from the farms, woodlands, and marshes; (2) continued high-water temperatures speeded up the rate of decomposition of organic material and the respiration rate of animals in the water; and (3) calm weather prevented mixing by winds, the only way in which the deeper waters can renew their oxygen supply.

Working closely with the Chesapeake Bay Institute of the Johns Hopkins University, Virginia's biologists have found that the deeper waters of the Chesapeake Bay off Tangier Island and in southern Maryland are completely devoid of oxygen. Oxygen-poor water is also prevalent in the Piankatank and Rappahannock Rivers in Virginia and the Potomac and Patuxent Rivers in Maryland.

In the lower 30 miles of the Potomac, water deeper than 20 feet contains no oxygen at all. This is true also of deep water at the mouth of the Rappahannock. Below 30 feet in the Rappahannock, the water contains only one-tenth the amount of oxygen it could hold, and it is in this deep water that crabbers are suffering losses. Fish and crabs (not caught in traps) can move into shallower water to escape the adverse conditions.

Water over oyster grounds in the Rappahannock still contains enough oxygen, but conditions could rapidly become worse if heavy rains bring more organic material from land and hot weather continues. This combination of circumstances, following hurricanes "Connie" and "Diane" in 1955, caused disastrous oyster kills in the Rappahannock River.



Washington

SALMON FISH FARMING SHOWS PROMISE: The Governor of the State of Washington announced in July 1958 that he has received an optimistic report on fish farming with salmon from the Director of the State Department of Fisheries.

Nearly 4 million salmon have been reared and released under a program that uses natural bays, estuaries, lagoons, ponds and lakes, the Director reported.

Since the State initiated the program in January 1958, the program has cost \$24,870, for land, construction, feed, and the eradication of predators.

The salmon are taken directly from fresh-water pools at the hatcheries and placed in ponds, sometimes directly into salt water. The mortality rate is low. The salmon are held in the natural basins until they reach the stage of growth where they would begin to migrate and then they are released.

In some of the basins two "crops" can be raised in one year. Seven lakes and lagoons have been planted with salmon or are ready to be planted. Thirty-five additional sites are under investigation or are in line for the construction of gates and hydraulic controls.

The success of fish farming will depend upon having sufficient spawn to incubate and rear large numbers of young fish and a number of suitable lakes and lagoons that are large enough and can be made ready for salmon rearing operations.

Areas under investigation are spread throughout the State, including Eastern Washington, so that the benefits therefrom may be distributed to the salmon fishing industry throughout the State.

The salt-water rearing program is expected to be accelerated following the acquisition of some 8 additional lagoons presently under survey. These areas comprise only those that have been converted to natural salmon rearing ponds or are concerned with fish-farm projects. As the program progresses, additional possible salmon rearing areas are expected to be found that will be suitable for the expansion of natural low-cost rearing areas.

The natural fish-farming program for salmon is carried out in conjunction with fish reared and released from the State's 19 hatcheries and 2 salt-water research stations (one at Pt. Whitney and the other at Bowman's Bay). This year's release of young salmon is expected to approximate 65 million fish. Additional plantings of salmon in Washington streams from Federally-operated stations amounted to about 48 million young salmon during 1957. This should be equalled this year.

Young fish marked and released from Columbia River, Grays Harbor, Willapa Harbor, and Puget Sound stations are showing up in fisheries from Central Alaska to Southern Oregon. A large percentage of Deschutes River-marked fish make up the sport catch in lower Puget Sound.

Note: Also see Commercial Fisheries Review, August 1958 p. 47.



Wholesale Prices, August 1958

The August 1958 edible fish and shellfish wholesale price index remained close to the near-record level of the preceding months and was only 1.6 percent below the 11-year record of June 1958. Seasonal declines in the wholesale prices of fresh and frozen shrimp and a drop in ex-vessel prices for haddock were primarily responsible for the slight decline (one percent) in the index between July and August this year. These lower prices more than offset some increases in wholesale prices for freshwater fish, frozen fillets, and canned tuna. The August edible fish and shellfish (fresh, frozen, and canned) wholesale price index (129.9 of the 1947-49 average) was 12.0 percent above the same month a year ago.

Although landings of groundfish (principally haddock) continued light in August, prices for large drawn haddock at mid-August were down about 13.6 percent from the preceding month; fresh Western halibut prices declined about 7.5 percent as the fishing season approached its peak and end. Increases of 5.7 percent in red king salmon prices, 40 percent for Lake Erie whitefish, and 8.3 percent for Great Lakes yellow pike more than offset the drop in haddock and halibut prices. Thus the index for the drawn, dressed, or whole finfish subgroup from July to August 1958 rose 1.1 percent. As compared with August 1957, the subgroup index this August was up 35.3 percent because August 1958 prices were substantially higher for all items in the subgroup except for Lake Superior whitefish (down 12.3 percent).

The fresh processed fish and shellfish subgroup index for this August declined 4.7 percent as compared with the preceding month, but was up by 6.3 percent from August 1957. Because landings of East Coast shrimp improved during

August, prices at New York dropped 8.1 percent from the previous month. Small haddock fillets at Boston were also lower (down 2.5 percent) due to the lower ex-vessel prices. But both of these items were priced higher this August (shrimp was up 7.7 percent and haddock fillets up 26.2 percent) than in August 1957.

The frozen processed fish and shellfish subgroup index was unchanged from July to August this year, but increased 1.8 percent from August 1957 to August 1958. Price increases from July to August of 2.5 percent for frozen haddock fillets and 4.7 percent for frozen flounder fillets were offset by a drop of 5.4 percent in the price for frozen shrimp at Chicago. Because of light production and very low inventories at the beginning of the season, all frozen fillets in the subgroup were priced higher (haddock up 20.8 percent) in August this year as compared with the same month a year ago, but shrimp was priced lower by 7.8 percent.

Canned fishery products prices this August were up from the previous month by 1.1 percent and from the same month of 1957 by 5.4 percent. Wholesale prices for canned pink salmon and Maine sardines were unchanged from July to August this year, but higher prices for canned tuna pushed this subgroup index up by 2.6 percent. All canned fishery products that make up this subgroup with the exception of pink salmon were priced higher in August 1958 than in August a year ago. The market remained firm for canned tuna and Maine sardines, but a drop in the wholesale prices of canned pink salmon was predicted as the month ended due to the good pack of this variety in Alaska. Future prospects for better catches of California sardines were good and the 1958 pack is expected to be substantially greater than in 1957.

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, August 1958 With Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices ¹ / (\$)		Indexes (1947-49=100)			
			Aug. 1958	July 1958	Aug. 1958	July 1958	June 1958	Aug. 1957
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					129.9	131.2	131.5	116.0
<u>Fresh & Frozen Fishery Products:</u>					147.2	150.0	150.4	127.0
<u>Drawn, Dressed, or Whole Finfish:</u>					152.7	151.0	147.2	112.9
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.11	.13	113.7	131.6	121.6	80.6
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.37	.40	114.5	123.8	123.8	99.0
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.80	.75	178.7	169.1	168.5	133.7
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.54	.54	132.6	132.6	132.6	151.2
Whitefish, L. Erie pound or gill net, rnd., fresh	New York	lb.	.88	.63	177.0	126.4	141.6	161.8
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.77	.70	179.4	164.1	129.0	152.4
<u>Processed Fresh (Fish & Shellfish):</u>					142.4	149.4	151.3	134.0
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.39	.40	131.0	134.4	124.2	103.8
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.91	.99	143.8	156.4	163.5	133.5
Oysters, shucked, standards	Norfolk	gal.	5.75	5.75	142.3	142.3	139.2	142.3
<u>Processed, Frozen (Fish & Shellfish):</u>					133.6	136.3	139.7	131.3
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.41	.40	106.0	103.4	103.4	102.1
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.35	.34	109.9	105.2	102.0	91.0
Ocean perch, skins on, 1-lb. pkg.	Boston	lb.	.29	.29	114.8	114.8	116.8	108.8
Shrimp, lge. (26-30 count), 5-lb. pkg.	Chicago	lb.	.89	.94	137.3	145.1	152.0	148.9
<u>Canned Fishery Products:</u>					105.7	104.6	104.7	100.3
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	23.00	23.00	120.0	120.0	120.0	120.0
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.95	11.65	86.2	84.0	84.0	80.8
Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 24 cans/cs.	Los Angeles	cs.	5.68	5.63	132.4	131.3	132.4	105.0
Sardines, Maine, keyless oil, No. 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	7.72	7.72	82.2	82.2	82.5	75.0

¹ Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.



FISH ROE

In Canada, a satisfactory method has been worked out for utilizing roes of cod, haddock, and pollock which are usually thrown overboard. The proteins and lipids are separated, resulting in a tasteless and odorless roe meal with a high protein content, and an odorless fish-egg lecithin which is of value in the preparation of pharmaceutical products.

--Eighth Annual Report of the Nova Scotia Research Foundation 1955



International

WORLD EXPORTS OF FISH AND FISH-LIVER OILS LOWER IN 1957

World exports of fish oils (including fish-liver oils) in 1957 totaled 185,000 short tons, a decline of over 10 per cent from 1956 but slightly above the 1950-54 average.

Smaller shipments from the United States--the world's leading fish-oil exporter--accounted for about two-thirds of the decline. United States fish-oil output in 1957, at 74,450 tons, dropped one-fourth from 1956; and demand abroad, particularly in West Germany and the Netherlands, was down.

Shipments of fish oils from Norway--the second-largest exporting nation--fell 18 percent from last year because adverse weather reduced the winter and spring herring catches.

Dutch exports were less than one-third those of the previous year; but imports also declined, indicating greater use of domestically-produced oils.

Angola's record-breaking exports in 1957 were more than double its 1956 shipments. West Germany is Angola's principal market.

The Union of South Africa's fish oil exports were more than twice those of 1956, but below those of 1955. Since

1953 the Union has imposed limits of 250,000 long tons each on the pilchard-maasbanker catches of Union and South-West African fishermen. The South-West Africans easily attain the quota each year, but the Union fishermen have not yet reached it. The catch was extremely low in 1956 because of difficulties in locating fish. This was probably the reason for reduced exports that year. (Agriculture Department's *Foreign Crops and Markets* of July 21, 1958.)

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FOOD AND AGRICULTURE ORGANIZATION

MORE FISHERY OFFICERS FOR LATIN AMERICA:

The Food and Agriculture Organization is expanding its regular program staff of fishery officers in Latin America so as to provide more direct and detailed assistance to the governments of the Region in formulating fishery policies and in realizing their plans for fishery development.

FAO has fishery officers stationed, respectively, at the FAO Regional Offices in Mexico City and in Santiago. A third officer will be stationed at the FAO Regional Office in Rio de Janeiro in the near future. In addition, there are nine technical assistance officers in Latin America at the present time, according to a personal communication from the Chief of the Program Coordination Service, Fisheries Division, Food and Agriculture Organization, dated August 12, 1958.

* * * * *

INTERNATIONAL PACIFIC HALIBUT COMMISSION

AREA 3A CLOSED AUGUST 31:

The closure of fishing in Pacific halibut Area 3A took place on August 31 (6 a.m. P.S.T.). The International Pacific Halibut Commission made the announcement on August 12 since it estimated that by August 31 the catch limit of 30 million pounds for Area 3A would be reached. The early closing of Area 3A caught most vessels by surprise, but landings and weather conditions were good, and the rate of fishing was considerably better than last year. In 1957 fishing in Area 3A ceased on September 22.

Fish Oils (including Fish-Liver Oils): Exports from Specified Countries and Estimated World Total Averages 1935-39 and 1950-54, Annual 1955-57					
Continent and Country	1957 ^{1/}	1956	1955	Average	
				1950-54	1935-39
..... (1,000 Short Tons)					
North America:					
Canada	3.0	9.2	9.3	11.6	12.0
United States ..	57.2	71.3	71.3	42.2	1.2
Total	60.2	80.5	80.6	53.8	13.2
Europe:					
Denmark.	9.8	9.7	14.2	6.3	2.5
Germany, West.	14.3	9.3	16.5	3.0	2.4.4
Iceland.	20.9	21.3	16.3	19.6	24.5
Netherlands ^{2/} ..	2.9	9.1	5.4	14.5	0.2
Norway.	35.3	42.2	20.9	33.0	38.0
Portugal.	4.2	4.7	5.5	3.8	4/
United Kingdom.	3.4	3.8	4.4	4.0	5.0
Total	90.8	100.1	83.2	84.2	75.6
Other:					
Angola	13.4	5.7	6.3	6.7	0.7
Japan.	3.5	5.0	10.2	6.8	35.0
Union of South Africa	11.4	5.4	13.3	8.9	2.2
Total	28.3	16.1	29.8	22.4	37.9
World Total^{5/}	185.0	210.0	205.0	177.0	135.0

^{1/}Preliminary.
^{2/}From Germany.
^{3/}May include some whale oil.

^{4/}Not available.
^{5/}Includes estimates for minor exporting countries.

^{1/}Preliminary.

^{2/}Excludes Germany.

^{3/}May include some whale oil.

^{4/}Not available.

^{5/}Includes estimates for minor exporting countries.

International (Contd.):

The Commission at the same time it announced the closure of Area 3A also announced that halibut fishing in Areas 3B and 1A were to continue until 6:00 a.m. (P.S.T.) October 16, 1957. Also, the second season in Areas 2 and 1B commenced at 6 a.m. (P.S.T.) August 31, for a period of 7 days without a catch limit, except that in Area 2 the Cape Scott and Goose Islands grounds in Queen Charlotte Sound at the north end of Vancouver Island shall be closed to halibut fishing during the second season. After the termination of the fishing seasons indicated, all halibut areas will be closed to regular fishing until the opening of the fishing season in 1959.

The official opening date for all halibut fishing in the Pacific regulatory area this year was May 4 at 6:00 a.m. (P.S.T.), except that fishing in Area 3B commenced on April 1, 1958.

This year Area 3A was open to fishing for 119 days--25 days less than the 144 days in 1957 (the longest season for this area since 1945 when the area was open to fishing for 147 days). Prior to 1955 the trend had been towards a shorter season, but since that year fishing has been spread over a greater number of days due to a combination of several factors: (1) a decline in the number of vessels fishing for halibut; (2) labor-management disputes; and (3) voluntary tie-ups by fishermen. As compared to 119 days for Area 3A this year, Areas 3A and 3B were open for halibut fishing for 104 days in 1956, 81 days in 1955, 58 days in 1954, 52 days (shortest on record) in 1953, 60 days in 1952, 56 days in 1951, 66 days in 1950, 73 days in 1949, and 72 days in 1948.

Area 1A includes the waters south of Heceta Head, Oregon; Area 3A, the waters off the coast of Alaska between Cape Spencer and the Shumagin Islands; and Area 3B, the waters west of Shumagin Islands and in the Bering Sea.

Areas 2 and 1B were closed to fishing on July 2 this year when the quota of 26.5 million pounds for Area 2 was attained.

Under authority of the Convention between Canada and the United States of America for the Preservation of the Halibut Fishery of the Northern Pacific Ocean and Bering Sea, this year's regulations became effective March 29, 1958.

TERRITORIAL WATERS

RESOLUTION OF WESTERN EUROPEAN FISHERY CONFERENCE CONDEMNES ICELANDIC UNILATERAL EXTENSION OF FISHING LIMITS:

The full text of the resolution unanimously adopted at The Hague on July 14, when representatives of seven European Nations met to discuss Iceland's extension of its fishing limits to 12 nautical miles, has now been published. The representatives of the fishing associations of all seven nations declare that they will continue to fish as before, and agree to urge their Governments to protect their fishing activities off the Icelandic coast after September 1, 1958.

The Resolution, submitted by the West German delegation, was handed to the governments of those Associations represented at the conference, and as the Associations of Norway and Sweden did not attend, it was dispatched to them for transmission to their Governments.

The full text of the Resolution follows:

"The Western European Fishery Conference, assembled at The Hague, on 14th July 1958, at which were present representatives of Belgium, Denmark, France, West Germany, The Netherlands, Spain, and the United Kingdom, note with the greatest displeasure that the Icelandic Government extended its fishing limit unilaterally to 12 nautical miles by decree on June 30th 1948.

"The Icelandic Government decree is a clear offence against International Law. The West European Fishery Associations concerned therefore protest most strongly against this unilateral action by Iceland and request their Governments to take the necessary measures to ensure that fishing vessels may as hitherto, fish up to the limits previously agreed off the Icelandic coast. The representatives of the West European Fishery Associations resolved unanimously that:

"1. Because several other countries have much older historic rights in these waters than the Icelanders, Iceland's claim to a 12 nautical miles fishing limit is without foundation. These other countries have fished there since the 15th century. Modern trawler fishing in the waters concerned was founded not by Iceland, but by other countries, at the end of the last century.

"It was only just before the First World War that Iceland began fishing with steam trawlers in the waters now claimed by her. Before the turn of the century only coastal fishing, near the coast, was carried on by Iceland, and that with small vessels. Therefore the countries who have fished off Iceland cannot give up their legal rights to fish these grounds, as by so doing they would be unable to maintain the supply of fish for the population of Europe.

"2. There can be no question of over-fishing the waters outside the recognized limits. If there were, Iceland would have to forbid trawler fishing to its own vessels as completely as it is forbidden at the moment within the four nautical miles limit to all nations, including Iceland. Nevertheless the West European Fishery Associations are ready to accept amicable agreements with Iceland on conservation measures in the waters off the Icelandic coast.

"3. In conclusion the representatives of the fishing associations of the nations here assembled, declare that they will continue to fish as before and agree to urge their Governments to protect their fishing activities off the coast of Iceland. In connection with this, they suggest that such efforts of the Governments concerned might be coordinated.

"4. Meanwhile, the West European Fishery Associations are of the opinion that they should meet again before September 1 to discuss additional ways and means to protect their industries against the effect of the unilateral action by Iceland, if previously a satisfactory solution has not been found." (The Fishing News, July 25, 1958.)

UNITED STATES-CUBA CONVENTION FOR CONSERVATION OF GULF OF MEXICO SHRIMP RESOURCES SIGNED

The Convention between the United States and Cuba for the conservation of the shrimp resources of the Eastern Gulf of Mexico was signed at Havana, Cuba, on August 15, 1958. The Convention contemplates international cooperation between Cuba and the United States aimed at developing and maintaining the maximum sustainable yield from these shrimp resources, and fills geographic need for preserving species valuable commercially to both countries.

Note: See Commercial Fisheries Review, February 1958, p. 49.

International (Contd.):

WHALING

AGREEMENT REACHED ON NUMBER OF CATCHER BOATS FOR 1958/59 ANTARCTIC SEASON:

An agreement has been reached between Norway, Great Britain, the Netherlands, and Japan whaling companies to restrict the number of catcher boats to 215 during the 1958/59 Antarctic whaling season. This total is one more than the number of catcher vessels used during the 1957/58 season. The nine Norwegian expeditions are allotted 95 catcher vessels, the three British expeditions 37, the one Netherlands expedition 14, and the six Japanese expeditions 69 (an increase of one over the number used in 1957/58), the United States Embassy in Oslo reports in an August 22, 1958, dispatch.

* * * * *

TENTH ANNUAL MEETING OF INTERNATIONAL WHALING COMMISSION:

The Tenth Meeting of the International Whaling Commission was convened at The Hague, Netherlands, June 23, 1958, pursuant to the provisions of the International Convention for the Regulation of Whaling signed at Washington, December 2, 1946.

At this meeting, the Commission (1) approved the expenditures for 1957/58 and the budget for 1958/59; (2) considered recommendations made by its Standing Committees; (3) adopted amendments to the Schedule annexed to the 1946 International Convention for the Regulation of Whaling; and determined that its eleventh meeting should be convened at London, England, June 22, 1959.

Conclusions: A number of the more important decisions during the Commission's Tenth Meeting were:

The 1958/59 Antarctic limit should be 14,500 blue-whale units, the Netherlands Government dissenting. Should this dissent be followed at the appropriate time by a formal objection by the Netherlands Government to this Amendment, the Antarctic limitation will automatically revert to 15,000 blue-whale units.

Extend for further period of five years (ending November 8, 1964) the protection to humpbacks in the North Atlantic Ocean by amending Paragraph 6 (1) of the Schedule.

Extend for a further period of five years (ending November 8, 1964) the protection to humpbacks in Antarctic Area II by amending Paragraph 6 (2) of the Schedule. At the same time, the area of protection was reduced by ten degrees of longitude and will now extend from 0° to 60° West Longitude, rather than to 70° West Longitude as before.

Rejected a proposal by Norway to extend the open season for humpbacks in the Antarctic from 4 to 8 days (subsequently reduced to 6 days when the vote was taken) by amending Paragraph 6 (3) of the Schedule. Subsequently, the Commission also accepted the withdrawal of the alternative Norwegian proposal for establishment of a quota of 1,250 humpbacks as a limitation on the Antarctic catch.

The proposal by Japan and Norway to commence Antarctic whaling prior to January 7 (the beginning date now in force under Paragraph 7 (a) of the Schedule) was withdrawn in view of inability to obtain outside the Commission a limitation on the number of catcher boats operating with a factory-ship.

Rejected the proposal for an extension of permitted whaling in the former Sanctuary (Area I) until November 8, 1960. This alteration of Paragraph 5 of the Schedule may be reconsidered at the Eleventh Meeting of the Commission since the prohibition now in force does not expire until November 8, 1959.

Postponed decision on the extension for a further period of five years (until February 24, 1965) of protection to blue whales in the North Atlantic Ocean in view of the reluctance of Iceland to abstain from taking this species during the past period when this prohibition has been accepted by Norway and other Contracting Governments.

Inasmuch as instruments of ratification for the Protocol containing a provision for "Methods of Inspection" have not as yet been deposited by Brazil, Mexico, and Panama, the Protocol was not in force during the Tenth Meeting of the Commission. Consequently, the Agenda items relating to (a) the appointment by the Commission of impartial observers on all whale factoryships, (b) the use of helicopters in whaling, and (c) the inspection of refrigerated ships were eliminated from further consideration during the Tenth Meeting.

Adopted recommendations intended to increase the recovery of whale marks and to insure adequate publicity regarding the purpose and importance of the whale-marking program.

Recommendations of the United States Delegation: UNITED STATES' PARTICIPATION IN FUTURE CONFERENCES: The United States Government convened the conference that negotiated the International Convention for the Regulation of Whaling signed December 3, 1946, which provides for the establishment of a permanent international organization, the International Whaling Commission. The United States has repeatedly demonstrated continued support and active interest in promoting sound conservation policies in relation to the natural resources, not only for our own country, but the entire world as well. Whales, which formerly were found in all oceans, are a world resource. This has become depleted and is now in a precarious condition, and that fact is recognized by the Contracting Governments. The Delegation recommends that the United States give continuing support to international regulation of the whaling industry. United States support for and continued participation in the work of the International Whaling Commission is regarded as one of the essential factors for the successful operation of the Commission and the conservation of the remaining whale stocks.

International (Contd.):

IMPLEMENTATION OF AGREEMENTS REACHED: The three amendments to the Schedule of the 1946 Convention for the Regulation of Whaling adopted by the Commission at its Tenth Meeting were in accord with the position of the United States. These amendments, if accepted by the Contracting Governments, will (a) establish a 14,500 blue-whale unit limitation for the 1959 Antarctic pelagic season, (b) extend the protection of humpbacks in the North Atlantic Ocean until November 8, 1964, and (c) extend the protection of humpbacks in Antarctic Sector II (0° to 60° West Longitude) until November 8, 1964. Immediate effect should be given to these regulatory amendments.

Objective Appraisal of the Tenth Meeting of the Commission from the Point of View of the United States: The position of the United States on the various items of the agenda, as in previous years, was determined from the point of view both of the conservationally desirable and the practically possible.

The various limitations which have been imposed through the medium of the International Whaling Convention have provided a needed restraint on the exploitation of Antarctic whale stocks. Nevertheless, the number of Antarctic expeditions has increased from 15 factoryships and 147 catcher boats in 1947 to 20 factoryships and 237 catcher boats in 1958. Furthermore, improvements in technology have been introduced which have increased the efficiency of both catcher boats and factoryships. There have been continuing efforts on the part of the whaling industry to obtain by private agreement a limitation on the number of catcher boats attached to each factoryship. During the 1957 Antarctic pelagic season all of the participating countries, with the exception of the U. S. S. R., agreed to a voluntary reduction of the number of operated catcher boats, and in 1958 a similar agreement was in effect which included all the countries concerned except for the U. S. S. R. and the Netherlands. Most segments of the whaling industry are anxious to arrive at a further private agreement for limitation of the number of catcher boats.

The view expressed in some circles of the whaling industry is that a more economical operation of the pelagic expeditions would result from such methods of limitation. In this connection, certain whaling interests have put forward the suggestion that a private agreement be negotiated which would have the effect of setting quotas for each country engaged in pelagic whaling. Such an agreement, in the eyes of the proponents, would, through setting the maximum catch in advance, have the desirable effect of making possible a limitation on the number of expeditions despatched by each country and thus bringing about a more economical operation. Under such a system, according to its proponents, it might be possible to accept a considerably reduced over-all catch limit.

As was pointed out in the report of the United States Commissioner to the Ninth Annual Meeting, reconciling commercial necessity with biological considerations and international conservation efforts to maintain whale stocks is becoming increasingly difficult in view of the mounting economic pressures. A workable balance between these conflicting interests must be maintained if the prima-

ry objectives of the 1946 Convention are to be achieved. Nevertheless, the decisions taken by the Commission in the Plenary Sessions reflected to a marked degree approval of the conservational recommendations made by the Scientific Committee.

Background: The International Whaling Commission was established in accordance with the International Convention for the Regulation of Whaling which was signed at Washington, December 2, 1946, and which entered into force November 10, 1948. It is the responsibility of the Commission, as conditions warrant, to amend the provisions of the Schedule annexed to the 1946 Convention, which are, in effect the regulations governing the conduct of whaling by the Contracting Governments. These regulations relate to the conservation and utilization of whale resources and include fixing (a) protected and unprotected species; (b) open and closed seasons; (c) open and closed waters, including the designation of sanctuary areas; (d) size limits for each species; (e) time, methods, and intensity of whaling (including the maximum catch of whales to be taken in any one season); (f) types and specification of gear and apparatus and appliances which may be used; (g) methods of measurement; and (h) catch returns and other statistical and biological records.

The Commission is also charged with the responsibility for taking action, either independently or in collaboration with other governments and public or private agencies to: (a) encourage, recommend, or if necessary organize studies and investigations relating to whales and whaling; (b) collect and analyze statistical information concerning the current condition and trend of whale stocks and the effects of whaling activities thereon; (c) study, appraise, and disseminate information concerning methods of maintaining and increasing populations of whale stocks.

Included in the agenda for the meeting were:

- (1) Report as to ratification of the Protocol for the Amendment of the International Whaling Convention 1946.
- (2) Blue whales in the North Atlantic--report as to Iceland; whaling in the North Pacific--question as to further research.
- (3) Review of the 1957/58 season's catch.
- (4) The question of advancing the opening of the baleen whale season in the water south of 40° south latitude, raised by Japan and Norway.
- (5) Opening of the Sanctuary.
- (6) Discussion of the blue whale unit limit.
- (7) Possible amendments to the Schedule.

The countries represented by Commissioners were the United States of America, Australia, Canada, Denmark, France, Iceland, Japan, Netherlands, New Zealand, Norway, Union of South Africa, Sweden, Union of Soviet Socialist Republics, and the United Kingdom. Brazil, Mexico, and Panama were not represented by Commissioners.

Portugal and Italy were represented by observers, as were the Food and Agriculture Organization of the United Nations (FAO), the International Council

International (Contd.):

for the Exploration of the Sea (ICES), and the International Association of Whaling Companies.

The United States Commissioner, Dr. A. Remington Kellogg, Director of the United States National Museum, Washington, D. C., was assisted by Stuart Blow, Foreign Service Officer, Office of the Special Assistant for Fisheries and Wildlife, Department of State, and Lieutenant Harry J. Gardener, Assistant to Senior Coast Guard Officer, Europe, U. S. Coast Guard, London, England.

Ratification of the Protocol for the Amendment of the International Whaling Convention 1946: The United States as the Depository Government notified the Commission at its Ninth Meeting (1957) that instruments of ratification for the Protocol to the International Convention for the Regulation of Whaling, 1946, containing a provision for "Methods of Inspection," which was signed by the representatives of the Contracting Governments at Washington on November 19, 1956, were deposited by the ambassadors of Iceland on November 23, 1956, Australia on April 8, 1957, Norway on April 15, 1957, Union of South Africa on April 25, 1957, United Kingdom of Great Britain and Northern Ireland on May 23, 1957, Japan on May 24, 1957, Sweden on June 6, 1957, Canada on June 14, 1957, and New Zealand on June 21, 1957. Inasmuch as all Contracting Governments had not deposited instruments of ratification by June 28, 1957, this Protocol was not in force during the Ninth Meeting of the Commission.

Instruments of ratification for this Protocol have been deposited since July 1, 1957, as follows: U. S. S. R. on July 3, 1957, Denmark on July 26, 1957, United States on August 30, 1957, The Netherlands on December 23, 1957, and France on April 14, 1958.

Instruments of ratification for this Protocol have not as yet been deposited by Brazil, Mexico, and Panama. Consequently, this Protocol was not in force during the Tenth Meeting of the Commission.

A motion by the Australian Commissioner, to request all commissioners to bring to the attention of their respective governments the desirability of instructing their missions in Brazil, Mexico, and Panama to stress the importance of prompt ratification of the Protocol, was made. It was seconded by the Canadian Commissioner and passed 12 in favor and 2 abstentions.

--Abstracted from the "Report of the United States Commissioner to the Tenth Annual Meeting of the International Whaling Commission. . ."



Angola

FISHING INDUSTRY, 1957:

The production of canned fishery products and fish meal and fish oil in Angola increased during 1957 as com-

pared with the previous year. There was a decrease, however, in the production of dried fish (table 1).

Table 1 - Angolan Production of Processed Fishery Products and Byproducts, 1956-57

	1957	1956
	(Metric Tons)	
Canned fish	1,861	1,774
Dried fish	24,805	27,229
Fish meal	85,205	77,703
Fish oil	7,209	4,658

Angolan exports of dried fish for 1957 totaled 15,403 tons, valued at US\$2.7 mil-

Table 2 - Angolan Dried Fish and Fish Meal Exports, 1957, by Destination

Product and Country of Destination	Quantity	Value
	Metric Tons	US\$ 1,000
Dried Fish:		
S. Tome and Principe	1,550	257
Mozambique	4,017	622
Federation Rhodesia & Nyasaland	955	170
Belgian Congo	6,963	1,275
French Equatorial Africa	1,200	259
Germany	683	85
Other	35	6
Total	15,403	2,674
Fish Meal:		
Portugal	890	109
Mozambique	259	32
United States	11,255	1,276
Spain	3,957	513
Germany	30,531	3,827
Belgium-Luxemburg	8,080	921
Holland	22,907	2,690
Italy	6,117	946
Other	10,153	1,178
Total	94,149	11,492

lion. Fish meal exports amounted to 94,149 tons, valued at US\$11.5 million.

Table 3 - Angolan Imports of Dried Cod, 1957

Country of Origin	Quantity	Value
	Metric Tons	US\$ 1,000
Portugal	315	189
United Kingdom	429	225
Norway	716	464
Other	13	8
Total	1,473	886

Angola (Contd.):

Angolan imports of dried cod during 1957 amounted to 1,473 tons with a value of US\$886,000.

Table 3 - Angolan Imports of Dried Cod, 1957		
Country of Origin	Quantity	Value
	Metric Tons	US\$ 1,000
Portugal	315	189
United Kingdom . .	429	225
Norway	716	464
Other	13	8
Total	1,473	886

Note: Values converted at the rate of one conto (1,000 escudos) equals about US\$35.

* * * * *

PLANS FOR REORGANIZATION OF FISHING INDUSTRY:

The need for reorganization of the fishing industry in Angola has long been recognized, a dispatch (July 31, 1958) from the United States Consulate at Luanda points out. This has been emphasized in the last two years when the value of exports of Angolan fish meal was found to be below the prevailing market price.

The fishing industry has been the subject of detailed study, and results show a great need for reorganization and refinancing. Equipment was found to be in need of replacement.

Action is being initiated in Mocamedes where concerns incorporated in the Mocamedes Fish Guild have agreed to conditions which were imposed by the Overseas Ministry in Lisbon. The Ministry has agreed to a loan of 90,000 contos (US\$3,147,000) of which 15,000 contos (US\$524,000) will be spent on an installation for the freezing and filleting of fish, as well as for the purchase of vessels and 12,000 contos (US\$419,500) on the enlargement, modernization, and development of the canning industry. A total of 63,000 contos (US\$2,203,000) has been earmarked for new units for the processing of fish meal and fish oil. The original agreement called for repayment in ten years at 5 percent interest per annum, although an attempt is

being made to extend the repayment period and reduce the interest rate.



Argentine Republic

FISHING SEASONS FOR IMPORTANT SPECIES:

The fishing season for anchovies and sardines began on September 1, 1958, and will last until the middle of October. The pack of these species is expected to amount to 50,000 cases (about 88 pounds per case net weight), according to a letter received from Mar del Plata. Also in that port, the season for Spanish mackerel will begin in November.

In the Patagonian port of Rawson, the shrimp fishery will commence in November and last for 2 or 3 months.



Bahama Islands

FISHERIES TRENDS:

Despite some of the greatest fishing waters available, production of fish almost remained static. Spiny lobster was the only commodity in any bulk, £194,089 (US\$543,449) of which was exported in 1957 to Florida. There are very few companies, all very small, which buy fish for local consumption or for export other than spiny lobsters. An indication is the very low figure of £411 (\$1,150) in 1957 gained by the export of scale fish.

Marine products of any quantity exported in 1957 include sponges £33,334 (\$93,335), marine curios £4,482 (\$12,550), conch shells £4,443 (\$12,440), and turtle shells £5,036 (\$14,100). (United States consulate at Nassau, report dated May 28.)

Note: Values converted at the rate of £1 equals US\$2.80.



Belgium

REACTION TO ICELAND'S DECISION TO EXTEND FISHING LIMITS:

Following Iceland's decision to extend its territorial waters fishing limits to 12 miles as of September 1, 1958, a report of an interview with representatives of Belgian fishing interests concerning their reactions to the Icelandic decision appeared in a June 6 issue of a Brussels daily newspaper.

Belgium (Contd.):

The Belgian fishing fleet consists of 465 vessels of various types and provides employment for 1,800-2,000 fishermen. Together with allied industries such as shipbuilding, fishing equipment, transportation, etc., the industry furnishes directly or indirectly a livelihood for thousands of individuals. The director of one of the most important Belgian fishing firms stated that the total annual volume of business of the fishing and related industries amounts to approximately 2 to 2.5 billion Belgian francs (US\$40-50 million).

In view of the magnitude of the volume of business involved, the press report describes the Icelandic action as "provoking a feeling of veritable consternation" and having "a serious economic repercussion in the country."

The industry director believes that the Icelandic measure would be a serious blow to the Belgian fishing industry. Inter Alia, it would force Belgian fishing boats into other North Sea areas, many of which are already fished out, or it would force the vessels to extend their areas of operation to such places as the Bear Islands, Spitzbergen, the White Sea, or the Greenland coast. If the latter becomes necessary only the very few Belgian fishing vessels constructed to operate at long distances could fish there, and their catch would not be nearly sufficient to sustain the fishing and related industries.

Some Belgian fishing vessels have drawn the fire of Icelandic coast guard vessels, and have returned to port with bullet-marked superstructures. As a result of the situation, Belgian owners have now strictly prohibited their captains from penetrating Icelandic waters except at their own risk. Thus, if Icelandic court action is henceforth brought against a Belgian fishing vessel, the owners will refuse to pay fines and costs.



British Guiana

EXPLORATORY SHRIMP FISHING OFF BRITISH GUIANA AND SURINAM:

The *Adventurer*, a 67-ton trawler, was chartered in July 1958 by a firm in Georgetown, British Guiana, for a survey of shrimp possibilities offshore near the British Guiana coast. The exploratory shrimp fishing was done in cooperation with a sistership from the Orinoco River mouth to the Amazon. Reports indicated that the best results were achieved off the Surinam coast outside territorial waters, states an August 8 dispatch from the United States consulate at Paramaribo.



Colombia

BASIC FISHING REGULATIONS IMPLEMENTED:

The Colombian Government, by Decree No. 1409, July 31, 1958, authorized the implementation of certain articles of the basic fishing Decree 0376, Decem-

ber 13, 1957, the United States Embassy reports in a dispatch from Colombia, dated August 6, 1958.

The December 13, 1957, decree was primarily a broad general outline of Colombian fishing regulations. The July 31, 1958, decree is more specific in purpose and discusses in detail the general provisions of the former. A summary of the decree follows:

Article 1: Fishing ships flying a foreign flag will only be permitted to fish in Colombian waters for certain fish, if they are under contract to Colombian canneries, which will sell part of their production to internal markets. The Colombian firms have one year in which to invest in a plant and must provide a financial guarantee of 100,000 pesos (US\$13,200).

Article 2: Companies with ships flying foreign flags must nationalize their fleets at the minimum rate of 25 percent a year.

Article 3: The Ministry of Agriculture has the authority to certify fish for export insofar as health and quality standards are concerned.

Article 4: Port officials have the authority to approve exports of fish in accordance with export regulations.

Article 5: The Banco de la Republica will fix the reintegro rate for exporters of fish.

Article 6: Inspectors from the Ministry of Agriculture have the right to board fishing ships at any time.

Article 7: Only ships flying the Colombian flag and domiciled in Colombia can fish for shrimp and certain other shellfish in Colombian waters.

Article 8: In order to obtain a license to fish for shrimp, the following conditions must be met: (1) each licensee must sign a 15-year contract with the Ministry of Agriculture, and (2) provide a bond of 150,000 pesos (US\$19,800) plus 10,000 pesos (US\$1,320) for each ship, to guarantee the nationalization of the ships within 6 months, and to guarantee

Colombia (Contd.):

the construction of installations for processing fish.

Article 9: Other edible fish caught while fishing for shrimp must not be thrown overboard but must be sold in Colombian markets.

Article 10: For the first five years of the 15-year shrimp contract, the fishing company is exempt from export taxes.

Article 11: Only 100 percent Colombian companies may fish for spiny lobsters, and the catch must be sold in Colombian markets and not exported.

Article 12: No authorization will be made for the processing of shellfish aboard ship. However, during the first two years, authorization may be granted for processing aboard ship in the case of tuna.

Article 13: Canning and packing ships must be anchored in port.

Article 14: The canning and packing of fish products aboard ships are subject to Colombian import regulations.

Article 15: Monies received through fines will be used in the public interest by the Fish Section of the Department of Natural Resources.

Article 16: The tax exemptions for fishing companies granted in Article 10 of the basic decree will also be extended to members of the firms.

Article 17: Starting from July 1, 1959, no licenses for shrimp boats will be granted unless the boats are Colombian-built and as far as possible constructed of Colombian materials. Boats nationalized prior to the above date are exempt from this regulation.

Article 18: Fines ranging from 1,000 pesos (US\$132) to 100,000 pesos (US\$13,200) will be imposed for violations of this decree.

Note: Pesos converted at rate of 7.59 pesos equal US\$1.



Cuba

CLOSED SEASONS ON LANE SNAPPER, MUTTONFISH, AND SPONGES TERMINATED:

The closed season on lane snapper ("biajaba"), originally imposed on May 5, 1958, was terminated by the Cuban National Fisheries Institute effective August 8, 1958, according to a resolution published in the Official Gazette, No. 152, dated August 7, 1958.

Termination of the closed seasons on muttonfish ("pargo criollo") and sponges, effective July 18, 1958, was announced in Circular No. 153 issued by the Director General of Customs on July 23, 1958. (U. S. Embassy in Havana, dispatch, August 15, 1958.)



Denmark

FISHERMEN PROTEST 12-MILE FISHING LIMITS:

At its annual meeting Denmark's largest fishermen's association, Dansk Fiskeriforening (with a membership of 10,000) adopted a sharply-worded resolution against expansion of the maritime fishery limit. The resolution condemned both Iceland's decision to implement such an expansion on September 1, and the parallel action of the local Faroese Government with respect to their own waters. The resolution requested the Danish Government to abandon its efforts to support the Faroese expansion, unless it could guarantee against detrimental repercussions upon the sale of Danish fish and fishery products which the association fears will be the result of such an expansion.

Alleging passivity on the part of the Danish fishermen at the time the fishery limits were discussed at the Geneva Conference, the Minister of Fisheries who has vaguely defended the Government's attitude toward the Faroe Islands, elicited the opinion of the other important fishermen's association, Vestjysk Fiskeriforening (membership 4,000, almost all engaged in North Sea fishing) on a possible expansion of Danish fishing

Denmark (Contd.):

limits to 12 miles. Referring to "the many problems involved," the association advised against such a move.

It is believed that what the fishermen's associations fear is not so much the effects on their sales and landings of fish in other countries, as the possibility that West Germany will follow the Icelandic procedure. Danish fishermen draw a large part of their catch within 12 miles of the West German shores.

LOANS FOR FAROESE FISHING FLEET:

The Danish Folketing has sanctioned loans of up to Kr. 7 million (about US\$1.0 million) spread over the next three years towards the renewal of the Faroese fishing fleet. About Kr. 36 million (US\$5.2 million) is to be raised to buy 8 large line vessels equipped with freezing plants, 8 cutters of 80 tons gross, and 3 trawlers, the latter already ordered from Portugal, according to an economic report on Denmark.

Local councils in the Faroese have asked the Faroese Lagting to finance the building of small cold storages in which to store frozen fillets awaiting shipment to the United States. (The Fishing News, July 11, 1958.)



France

TUNA CANNING AND TUNA FISHING CONTROVERSY:

The French tuna canning industry and the tuna fishing industry are in the midst of a controversy. Since stocks of canned tuna have been mounting too quickly, the tuna fishing industry has been urging that controls be imposed to prevent devaluation in the market. The canning industry, however, is against this and favors price reductions, thereby increasing consumption. France's annual consumption has been approximately 20,000 metric tons, but the 1958 landings are expected to yield 25,000 to 30,000 tons.

A committee will examine the situation and make final recommendations. (World Fishing, August 1958.)



Honduras

NEW FISHING REGULATIONS ISSUED:

New temporary fishing regulations aimed at protecting the marine fishing resources of Honduras, especially in the Atlantic Ocean, have been put into effect by the Minister of Natural Resources of Honduras, under the powers granted by Article 10, Decree Law No. 8, dated December 24, 1954. These temporary regulations are to be in effect until the National Congress enacts a "Law of Sea Fishing," which will be submitted for consideration during the next session of the Legislature.

According to the new regulations, fishing activities in the waters of Honduras are prohibited unless previous permission for such fishing has been granted by the Ministry of Natural Resources and the following conditions are observed:

1. Of the value of exports, 5 percent must be paid to the nearest customs office.
2. An annual fee of £500 (US\$250) must be paid to the Directorate of Social Welfare.
3. Of the fishing crews employed, 90 percent must be Hondurans.
4. Fishing vessels must be registered with the Ministry of Finance.
5. Fishery products sold in Honduras must be sold at a price lower than the wholesale export price.
6. Accounting records must be kept in Spanish and submitted to the Honduran authorities for inspection, as required.



Iceland

DECISION TO EXTEND FISHING LIMITS REAFFIRMED:

At the meeting of a 3-day Scandinavian Fishery Congress, which opened on August 13, 1958, Iceland's representative reaffirmed his Government's decision to extend the fishing limits despite pleas from other Scandinavian countries for negotiation. The Icelandic representative stated that his country took the initiative for international negotiations ten years ago. He further stated that Iceland had waited long enough and that it must now protect its own vital interests.

A representative from the Faroe Islands indicated that it might ultimately be necessary to take the matter to the World Court at The Hague. He pointed out that the Faroe Islands were entirely dependent on fishing for a livelihood.

FISHERIES TRENDS, 1957:

With the addition of three new factories, Iceland now has a total of 84 freezing plants, with a capacity to handle a much greater output than presently produced.

Technical improvements include the installation of 50 filleting machines and widespread adoption of nylon nets and lines.

The motorboat fleet has been augmented; three new trawlers have arrived in the last year to replace those previously foundered, but financing is being sought for the acquisition of additional trawlers.

The 1957 fish catch was 1.7 percent less in quantity and 5.7 percent less in value than that of the previous year. The quantity of frozen fish produced rose, and that of salted and stockfish declined as compared to 1956. The 1958 main winter groundfish season was considerably better, however, and landings for the first four months of 1958 were 26 percent above those for the same period of 1957. Prospects for the summer herring season were reported good.

The Export Fund Law of May 31, 1958, simplifies the previously complex system of export supports to offset the handicap of the officially overvalued krona, and makes the Icelandic Export industries liable for payment of an exchange surcharge on fuel and operational goods. Recent trade agreements and export contracts are likely to release somewhat more fish from clearing countries for sale in free currency markets.

FISH FREEZING AND PROCESS- ING CAPACITY INCREASED:

Iceland has steadily increased its capacity for processing fish, particularly frozen fillets, which have provided the greatest foreign exchange profit. An expansion of freezing capacity and a shift towards freezing, away from other methods of utilization, occurred after the British fishing industry imposed a ban in 1952 on the landing of fresh fish from Iceland. Although the ban was lifted in 1956, the trend, already under way continued in 1957.

Three new freezing plants were added in 1957, making a total of 84, with a combined peak capacity of 1,200 tons of fillets per 16-hour day, according to an article in *Agfir*, the organ of the Fisheries Association of Iceland. This capacity would make it theoretically possible for the Icelandic industry to process for freezing a total of 1.2 million metric tons of gutted whole fish a year (assuming 300 days of annual operation and on the basis of fillets being the equivalent of 31 percent of the weight of the whole fish). But the entire 1957 catch, including herring, amounted to 436,327 tons of gutted fish (actually herring, which amounted to 117,495 tons of that total, is weighed round), of which only 192,000 tons were delivered to the freezing plants. The rest were utilized either fresh or processed in other forms.

On this basis, it would appear that the freezing plants as a whole were used at only 16 percent of their annual capacity. Actually, there are extenuating circumstances. For one thing, the largest part of the catch is highly seasonal, being concentrated in the first four months. Furthermore, the plants do not work a 16-hour day except during periods of peak deliveries from trawlers--when in some communities it is necessary to close the schools in order to get sufficient staff. The Icelandic labor force is quite inadequate to permit freezing plants being operated at anywhere near their maximum mechanical capacity. The plants normally operate a 10-hour day during the season. At this rate, the total daily freezing capacity for Iceland is about 800 tons of fillets, but the productive capacity of the plants is far below this mechanical capacity, since it is limited by three factors:

- (1) The labor shortage, combined with the opposition of the unions, makes it impossible to operate on a shift basis. Even the normal 10-hour day involves two hours of overtime. Some 5,000-6,000 workers were engaged in the plants during the groundfish season ending May 10, but it was necessary also to hire some 100 Faroese women workers for the plants.

- (2) The type of packing for fillets is also a consideration. The parchment-wrapped 7-pound packages for the Russian contract are easy and inexpensive, but far more is involved in preparing the one- and five-pound packs with more elaborate packaging of more carefully trimmed fillets, for the United States market specifications.

- (3) There has been a prevailing shortage of raw material. Fish catches have been rising gradually during the last few years (except for 1957), but have by no means kept pace with the increase in processing capacity. Many freezing plants, particularly those not associated with trawlers, have been generally short of supplies. This has given rise to a demand by some Icelanders that the long-standing prohibition on the local sale of foreign trawler fish should be lifted.

Iceland (Contd.):

Such a course would seem particularly logical in the case of herring factories, where overcapacity is even more marked than in the case of freezing plants and where ample herring for processing is caught by Norwegian boats off the Icelandic coast and shipped back to Norway in motherships. The law prohibiting the landing of fish from foreign vessels was enacted initially in the 1930's for the protection of Icelandic seamen. Opposition to its repeal now, when the need for such protection has largely disappeared, seems to be based mostly on the fear that such repeal would encourage further exploitation of inshore fisheries by foreign vessels.

Technically, the most important development in the industry during the last year and a half has been the introduction of 50 German automatic fish filleting machines, financed by a 5-percent West German loan. The 1956 purchase contract for these machines amounted to DM8 million (US\$1.9 million), and the machines are to be paid for in four years. Plant managers testify that the machines, which result in a net saving of at least 15 workers, have proved indispensable during peak periods, because of the increasing difficulty of getting adequate staff. Another advantage is that, in the case of the cod-filleting machine at least, they have been able to cut more closely than the average manual filleter, with the result that there is an average yield of 1 to 2 percent more from the whole fish. On the other hand, it is believed that the machines purchased by freezing factories in some isolated ports, which are not favorably situated for raw material supply and which were established principally to give employment in smaller towns, have not yet proved to be economical.



Israel

EXPANSION OF FISHERIES PLANNED:

In an effort to increase local consumption of salt-water fish, some details on fish consumption habits and on Israel's fishing industry in general were presented at a recent fish exhibition in Tel Aviv sponsored by the Ministry of Agriculture. Current average per capita fish consumption in Israel totals 24.2 pounds a year. Total domestic consumption amounts to 22,000 metric tons, of which 10,000 tons are being imported at a cost of US\$2.3 million. The imported items are mainly herring and fish fillets, and consumption is likely to increase, once housewives who are still reluctant to buy frozen salt-water fish will realize that frozen fish compare favorably with live pond carp, the type of fish mostly consumed in Israel. A five-year plan of the Fisheries Division to expand the country's fisheries is expected to boost the catch to 18,000 metric tons in 1963, as compared with 12,500 in 1958, which would also increase the number of workers employed in this branch of the economy from the present 3,500 to 5,000 by that time.

Israel fishermen will also operate in the Atlantic Ocean and the Red Sea, and

by the end of 1958 the Kishon fishing harbor should be ready to shelter the fishing fleet which is at present based at Haifa port. There are now 17 companies with 29 trawlers engaged in deep-sea fishing in Israel.

Among other plans for expanding the country's fishing industry is the establishment of a freezing plant and a factory for the production of fish meal in Eilat. The latter enterprise is planned to be erected by a Belgian investor who intends to operate five fishing trawlers in the Red Sea, with the catch either to be sent to northern Israel for marketing, or to be processed into fish meal. It is also contemplated to process lobster and squid in northern Israel and it is expected that these products will find a ready market in Western Europe and the United States. Some attempts to develop the export of canned fish products have already been made with trial shipments of carp to the United States and Australia, while the possibility of canning tuna from frozen tuna imported from Japan is also being considered. (United States Embassy dispatch from Tel Aviv, dated August 14, 1958.)



Japan

ANALYSIS OF FISHING INDUSTRY:

Fishing is one of the oldest and most important industries in Japan. It provides a livelihood for some 3 million fishermen and has an annual output of close to US\$694 million.

Japan, which is situated in one of the world's three richest fishing areas, accounts for about 17 percent of the world's total fisheries production. It ranks first, followed by the Soviet Union, the United States, and Norway.

Despite the recent increase in their consumption of meat, eggs, and milk, the Japanese still depend on fish and shellfish for as much as 70 percent of their total animal protein intake.

A part of the fisheries production is exported, earning about US\$167 million in foreign exchange annually.

Japan (Contd.):

Ocean Operations: Fishing, as conducted in Japan, can be classified into coastal, offshore, ocean, river, and lake fishing. Largest in scale is, of course, ocean fishing.

In ocean operations, the fishing vessels are usually organized into fleets, each with a mothership. These mother-ships, often of 10,000 metric tons or more, are sea-going plants which process the catches and also supply food and fuel to the fishing vessels.

Notable examples of ocean fishing are whaling in the Arctic and Antarctic, salmon and crab fishing in the North Pacific, cod fishing, tuna fishing in the South Pacific, and pearl oyster gathering in the Arafura Sea off Australia. Trawl fishing in the East China Sea and tuna fishing in the Indian Ocean and in the Atlantic are conducted by individual vessels.

Rehabilitation and Modernization: By the end of the Pacific war, the total number of fishing boats in Japan had been reduced to 279,000. Rehabilitation progressed so rapidly, however, that the total reached 480,000 in 1950, surpassing the prewar record. After that, the rate of increase declined, chiefly due to the shift of emphasis to modernization.

In 1945, only 20 percent of Japan's fishing vessels were motorized. In 1957, the figure was 39 percent. The total tonnage of fishing boats in Japan was 1,570,000 tons at the end of 1957, with motor-powered vessels accounting for 1,340,000 tons.

Substantial progress has been made also in the modernization of equipment. For instance, fish detectors have helped eliminate much of the uncertainty in fishing operations, while inclinometers, radar, and loran have made it possible for fishing vessel crews to navigate under every weather condition.

Remarkable improvements have also been made in fishing nets. The synthetic fiber nets now being used have proved to be both more durable and easier to handle than the conventional cotton yarn nets.

Such modern equipment, however, is for the most part limited at present to larger-sized ships. Coastal fishing, conducted mainly by small vessels, has been left behind in the pace of technical progress.

Fishery Output: The annual catch of the Japanese fishing industry, which ranged from 4,200,000 metric tons to 4,300,000 tons (excluding whales) in the prewar period, had dropped to 2,050,000 tons in 1945 when the war ended. With the peace, fishery output steadily recovered, topping the prewar record in 1952. In 1957 it totaled from 5,300,000 tons to 5,400,000 tons.

In 1956, coastal fishing accounted for about 48.7 percent, offshore fishing 33.9 percent, and ocean fishing 17 percent of the total fish catch of the nation. Thus, although its relative importance in the Japanese fishing industry is waning, coastal fishing still supplies nearly half of the total Japanese fish catch.

The proportion of the total catch occupied by shellfish, crabs, lobsters, shrimps, cuttlefish, and other such marine life was greater in 1957 than in 1936. The hauls of mackerel and pompano have also increased considerably. The catch of salmon and of tuna, especially important for export purposes, have also exceeded the prewar level.

In contrast, sardines, which occupied 49 percent of the total fish catch in the prewar period, declined to 19 percent. Herring fishing in Hokkaido's coastal sea has dropped sharply.

Size of Enterprises: Japanese fishing enterprises range in size from giant corporations, capitalized in excess of US\$14 million, to small family enterprises.

Of the 250,000 fishing enterprises in Japan, small family enterprises occupy a dominant 92 percent while large firms with more than US\$277,777 in capital can be counted on one's fingers.

The largest fisheries companies all have several 10,000-ton class mother-ships and operate on a large scale in whale catching in the Antarctic Sea, salmon and crab fishing in the Northern Pacific, tuna fishing in the Pacific and

Japan (Contd.):

large-scale trawling. Whale meat, canned salmon and crab meat are mostly the products of these big companies.

In contrast, family enterprises are engaged in small-scale angling and net fishing in the coastal waters with small motorized or rowed boats. These fishermen operating on their own resources comprise about 80 percent of the total labor population of the Japanese fishing industry.

The central role in the Japanese fishing industry is being played by medium-size enterprises. They usually engage in offshore and ocean fishing with vessels ranging in size from 10 to 200 tons, and supply most of the fish consumed by the Japanese.

Consumption of Marine Products:

Most of the nation's marine products is consumed domestically, only 9 percent being exported annually. About 87 percent of the total supply to the Japanese market is consumed as food, the remaining 13 percent as animal fodder and fertilizer. Before the war, as much as 40 percent of the total catch was used for nonfood purposes.

Fish and other marine products used as food may be classified into those consumed without processing and those consumed after processing. The former accounts for about 32 percent and the latter, 68 percent of the total, showing a decline in the percentage of the consumption of processed fishery products.

Changes have also taken place in the tastes of the Japanese. In urban centers there was a remarkable increase in the consumption of fresh, dried, and salted fish until around 1953, but the rate of increase slowed down somewhat after that. From 1954 on, however, sales of salted salmon, fish sausages and hams, fish tempura, and canned fish have grown steadily. Most remarkable has been the increase in the sales of fish sausages, a postwar innovation. Production was about two million pieces in 1953 and soared to some 200 million in 1956.

Another postwar development is the large increase in the consumption of

fish foods in the rural areas. This is attributed chiefly to the development of motor-truck transportation and the rise in the general living standard of rural families.

Export of Marine Products: Marine products exports have been continually increasing and totaled some US\$163 million in 1956, or 6.5 percent of total Japanese exports. Between 1934 and 1936, the annual average was about 4 percent. The exports of about 9 percent of the total output, however, were considerably below the prewar level.

A dominant portion--about 55 percent--of marine products exports from Japan in 1956 was canned fish. Frozen fish is the single item which made the greatest advance in export in the postwar period, going to five times as high as the prewar level, but the recent decline in price has hampered a further advance in the total value of this line of exports.

Fish oils and fats are also an important item, amounting to some 13 percent of total exports of marine products. Exports of pearls are steadily growing, while those of salted goods and isinglass are on the decline (*Japan Report*, vol. IV, no. 16, August 15, 1958).

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EXPORTS OF TUNA LOINS AND DISCS TO UNITED STATES MAY RESUME:

A plan for resuming exports of tuna loins and discs to the United States was recently formulated by the Japan Frozen Food Exporters Association and Japan Frozen Tuna Producers Association, according to trade press reports. The plan, adopted at a meeting on August 12, 1958, resolved to make formal application immediately to Japan's MITI and Fisheries Agency to approve the resumption of exports. If the plan was approved, exports were expected to begin in September 1958.

Contents of the plan had not yet been published, but it is thought to contain the following points:

(a) strict control to be exercised on production and exports of loins and discs to the United States; (b) the export quota to be held within 3,000 tons during the

Japan (Contd.):

first year, with assignment of quotas to be based on the business of the past 2 years; (c) export quotas not to be separated as albacore or yellowfin, and as loins or discs, but in the case of albacore loins, the amount will be deducted from the round fish quota in the ratio of 2 to 1; (d) loins and discs to be produced by plants designated by Japan's Producers Association, with strict quality control; (e) all products to be consigned to a joint sales company; (f) all sales to be handled by a "loins" committee of Japan's Exporters Association, with price cutting to be prevented, and the embargo on sales to California to be removed; and (g) request the Government to establish a check-price system, thought likely to be US\$700 per ton for albacore loins, US\$550 for yellowfin loins, and US\$20 more on each for discs.

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CANNED TUNA IN AGAR JELLY:

A new type of flavored canned tuna in agar jelly, exported for the first time last year to the United Kingdom, is finding rapidly growing acceptance in foreign markets, particularly in West Germany, according to trade press reports. From January to July of this year shipments amounted to 25,000 cases to West Germany, 15,000 to Canada, 3,000 to the United Kingdom, and 1,000 to the Netherlands. In addition to that already shipped, another 15,000 cases were sold to West Germany, and it is believed that 100,000 cases can be sold by the end of the year.

Of the amount sold so far this year, about one-fourth was whitemeat tuna, the rest lightmeat. Prices of US\$5.15 a case for lightmeat tuna and US\$6.25 a case for whitemeat tuna are considered low, but it is expected that once a regular market for this product is developed, the price can be raised. The tuna in jelly sold to Canada has all been whitemeat, and the price has been US\$6.80 a case. The demand from Canada is said to be strong, but with the current shortage of albacore, the question is whether Canada will accept lightmeat tuna in this type of pack.

The West German fishing industry has asked the Government's Ministry of Food and Agriculture to take measures to re-

strict the rapidly growing imports of Japanese tuna. Canned tuna from Japan made up 50 percent of West Germany's processed fish imports in December 1957, 64 percent in January 1958, and 70 percent in February 1958, a dispatch (August 14, 1958) from the United States Embassy from Tokyo reports.

The canned-tuna-in-jelly pack consists of large irregular flakes and agar jelly only slightly greater than the quantity of oil usually found in the oil pack. The flavor to one taster was strongly reminiscent of Vienna sausage.

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NORTH PACIFIC MOTHERSHIP SALMON FISHING AS OF AUGUST 10, 1958:

The 15 Japanese North Pacific salmon fishing mothership fleets (432 catcher boats) operating in the Aleutian area as of August 10 had caught 85,116 metric tons of salmon. Last year by July 25 the 14 motherships and 405 catcher boats had achieved their quota of 87,000 tons and had left the fishing grounds. The quota for these 15 fleets for 1958 was 85,667 tons but was readjusted in July to 85,169 tons.

The one fleet (28 catcher boats) operating this season in the Okhotsk area achieved its quota of 6,498 tons as of August 10. The quota for this fleet had been set at 6,000 tons, but in July was readjusted to 6,498 tons. Last year this fleet achieved its quota of 13,000 tons by July 31.

The over-all quota for Japanese North Pacific salmon fishing for 1958 is 110,000 tons: 85,169 tons for the fleets fishing in the Aleutian area, 6,498 tons for the fleet fishing in the Okhotsk area, and 18,333 tons for the shore-based salmon fleets on Hokkaido Island (Hokkai Suisan, Special Issue No. 9, August 12, 1958).

By July 31 this year the Aleutian area fleets had caught 72,683 tons of salmon. On August 3 the fleets were reported operating approximately in the area bounded by 47°36' N.-51°24' N. latitude and 160°00' E.-167°36' E. longitude. The fleet operating in the Okhotsk area (52°30' N.-154°30' E.) by July 31 had caught 5,785 tons of salmon.

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Japan (Contd.):

EXPORTS OF SELECTED FISHERY PRODUCTS
TO THE UNITED STATES, JANUARY-APRIL 1958:

During the first four months of 1958, Japanese exports

of frozen tuna to the United States were valued at US\$4,702,000, a decrease of 2.5 percent as compared with US\$4,818,000 for the same period in 1957. Canned tuna exports to the United States January-April 1958 were valued at US\$4,216,000, an increase of 4.6 percent over the January-April 1957 value of US\$4,029,000.

Japan's Exports of Selected Fishery Products to the United States, January-April 1958												
Item	Value						Quantity					
	Mar.		Apr.		Jan.-Apr.		Mar.		Apr.		Jan.-Apr.	
	1958	1957	1958	1957	1958	1957	1958	1957	1958	1957	1958	1957
	(US\$1,000)						(Metric Tons)					
Tuna, frozen . . .	1,200	1,579	1,283	688	4,702	4,818	4,198	5,243	4,359	2,315	16,414	16,366
Tuna canned . . .	895	1,358	1,083	1,092	4,216	4,029	1,039	1,454	1,262	1,190	4,892	4,315
Crab meat, canned	452	445	467	1,031	1,501	2,158	186	181	200	398	690	877
Other canned . . .	2,840	790	1,072	726	6,315	3,388	3,355	887	1,299	835	7,070	3,894

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SUMMER ALBACORE CATCH
UNEXPECTEDLY SMALL:

The summer albacore fishing season off the Japan coast has ended with estimated landings of only about 22,000 short tons, the lowest since 1951 and little more than half of last year's landings. Of this total, freezers bought about 7,500 tons, and canners some 14,500 tons. Ex-vessel prices have risen steadily throughout the season from around US\$275 to \$320-320 a short ton, and appear to have averaged about twice the level of last year's low prices. Sales of frozen round fish for export to the United States at prices as high as US\$350 per ton were reported in the first week of July.

It appears likely that some sales contracts for frozen fish for the United States market will have to be cancelled or filled with winter albacore or mother-ship fish, and that the planned canned tuna production ratio of 65 percent white meat (albacore) to 35 percent light meat (other tuna species) may have to be changed to 50 or 55 percent light meat. (United States Embassy dispatch from Tokyo, dated July 11, 1958.)

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SALMON FISHING IN NORTH
PACIFIC BY MOTHERSHIP
FOR 1958 COMPLETED:

On August 9 and 10, 1958, the 15 Japanese salmon fleets fishing the Bering Sea and North Pacific east of Kamchatka and the single fleet fishing the Sea of

Okhotsk completed their 1958 season. This ended three months of fishing which began on May 11. The rate of catch for these fleets was much slower this year than last, and gloomy predictions were freely made during most of the season that it would be impossible to fill the catch quotas of 85,667 metric tons on the east side and 6,000 tons on the west side of Kamchatka. The final total, however, was 91,614 tons, only 53 tons short of the goal.

This successful end to the season was only made possible, however, by the action of the Japanese Fisheries Agency in modifying the terms of the fleets' licenses during the last week of fishing so that those fleets which had completed their individual catch quotas early could continue fishing and credit their excess landings to the quotas of the fleets that were falling behind. Similarly, catcher boats that were close to their limit of 24,000 red salmon were allowed to continue fishing with the understanding that fish of this species over the number of 25,200 (the original limit plus the 5-percent leeway allowed) would be credited to boats that were short. Financial settlements among fleets and catchers after their return to port are expected to present some knotty problems.

This season marks the first time since the high-seas North Pacific salmon fishing was resumed in 1952 that such extraordinary measures have had to be taken to attain the catch goal. The filling of the quota was regarded seriously be-

Japan (Contd.)

cause it was feared that a failure to do so would be used by the Soviet Union as evidence of depletion of the resource and therefore as a reason for further reductions in the catch to be allowed Japan in future years. Ironically, one of the biggest contributions to the late season readjustment (498 tons) was made by the fleet operating in the Sea of Okhotsk, an area from which Japanese fishing is to be barred after this year on the ground that salmon resources there are badly depleted. The comparatively good fishing enjoyed by this fleet has stimulated demands for a reconsideration of the Okhotsk closure among Japanese salmon fishermen, who are by no means reconciled to the loss of these rich grounds. It seems doubtful that the Russians will be disposed to make any concession there: the Chief of the Soviet Fisheries Observation Team during a tour of Japan frequently lectured the Japanese on the sad state of the salmon stocks of the Soviet Far East.

It is reported that the over-all catch limit of 11 million red salmon was exceeded, but not by more than 5 percent at most. Published estimates of the mothership pack are 520,000 cases of red salmon, 80,000 cases of silvers, 550,000 cases of pinks, and 180,000 cases of chums. Chum and silver salmon fishing was better than last year, but the pink salmon catch fell below expectations.

The 460 gill-net boats which fished for the 16 motherships are reported to have earned for the most part between \$47,000 and \$50,000 per boat for the season, at prices (per fish) of 83 cents for reds, 57 cents for silvers and kings, 35 cents for chums, and 21 cents for pinks.

Returning fleet managers were quoted as blaming the slow fishing this year on the 5-day delay in sailing for the grounds, bad weather during the season, unusual migration patterns of the fish, and the necessity for limiting the red salmon catch, but they were emphatic in declaring that there was no evidence of a real scarcity of salmon. The fish were

simply not to be found in the same areas where they were abundant last year.

All fleets returned to their base at Hakodate between August 14 and 19, according to an August 21, 1958, dispatch from the United States Embassy in Tokyo.

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ESTIMATED SALMON PACK AND EXPORTS FOR 1958:

On August 10, 1958, the 16 Japanese salmon mothership fleets ended their 1958 fishing season with a total catch of 91,614 metric tons.

At the end of August the trade press reported that salmon fishing by vessels operating individually out of eastern Hokkaido ports was also drawing to a close for this season. In the land-based fishery about 850 vessels of over 10 gross tons (490 gill-netters, 360 long-liners) participated; including boats under 10 tons, the fleet was estimated at approximately 1,000 vessels. They landed approximately 43,000 metric tons of salmon (valued at \$12.7 million), principally at the ports of Kushiro, Akkeshi, Hanasaki, and Hiroo. Prices during the season ranged from 10.5 to 13 cents a pound for chum and 9.25 to 15 cents for pink salmon.

With the mothership pack completed and land packing nearly finished, estimates of expected consignments to the Canned Salmon Joint Sales Company can now be made with some accuracy. These estimates are currently running 1,880,000 to 1,910,000 standard cases, broken down as follows: reds, 620,000-630,000; pinks, 860,000-880,000 (including 470,000 talls); chums, 220,000-230,000; silvers and kings, 120,000; and tidbits, 40,000-50,000. This is a decline from last year's 2,277,000 cases, especially in red and pink salmon (respectively 1,074,000 and 1,057,000 cases last year).

Despite this year's lower production, it is anticipated that the carryover into the new fiscal year (beginning in April 1959) will be larger than this fiscal year. The large catch of pink salmon in Alaska threatens to curtail Japanese sales of that species in the United States, and

Japan (Contd.):

their sales of chums in Belgium and the Netherlands are being held down by the competition of lower-priced Canadian fish, although a US\$1 cut in the price of chums to that area on August 20 may help matters. With the new pack and the present inventory of 520,000 cases, the joint sales company will have 2.42 million cases to sell. It is said that the most that can be hoped for in the way of export sales by next March is about 50,000 cases to the United Kingdom, 500,000 cases (100,000 red and 400,000 pink talls) to the United States, and 300,000 cases to the "C" area (continental Europe, Australia, and elsewhere), leaving 1.6 million cases to be carried over into the 1959 production season.

With prospects for canned salmon sales poor, the mothership operators have increased the proportion of frozen salmon produced this year, and this product is reportedly selling well in the United Kingdom. Sales contracted to the end of May were estimated at about 2,500 tons, mostly dressed reds, and the total sales to the latter part of August are estimated at around 5,000 tons, at prices of about \$940 a ton. It is predicted that exports of frozen salmon this year may approach 10,000 tons, about three times last year's and far above those of any previous year.

CANNED SALMON TRENDS:

Japanese trade sources indicated that stocks of canned red salmon amounted to about 200,000 cases as of August 1958, as compared with approximately 600,000 cases in March and nearly 1 million cases at the beginning of 1958.

Sales of canned salmon to the United Kingdom were heavy during May-July 1958; sales to Belgium and the Netherlands (traditionally pink and chum salmon markets) amounted to 500 cases in June and 200 in July.

The total pack of Japanese canned salmon in 1958 is expected to amount to approximately 1,850,000 cases as follows: 550,000 cases red salmon,

150,000 silver, 970,000 pink, and 180,000 chum. Of this total pack, about 800,000 cases will probably be sold to the United States and Canada, and about 400,000 cases are expected to be sold in European countries, Australia, and other nations.

FISHERIES LOANS ACTIVITIES,
APRIL-JUNE 1958:

The fisheries trade press reports that during April-June 1958 the Fisheries Financing Fund of the Japanese Ministry of Agriculture and Forestry handled 254 requests for loans, totaling \$3,552,638. Loans were granted in 176 cases for a total amount of \$2,054,083, slightly less than 58 percent of the amount requested. In the two largest categories--vessel construction and outfitting, 112 loans, \$1,782,722; and fishing port construction and repair, 23 loans, \$78,191--the total amounts loaned were less than one-fifth and one-tenth, respectively, of the sums planned for the year. The generally low ebb of loan business by the Fund is believed to indicate that the more conspicuous needs for financial assistance to the fishing industry existing in the postwar period have now been pretty well covered; the proportion of unsuitable projects in loan applications is increasing; and the operations of the Fund are due for a general review in the near future.

Loans from the Fund bear interest rates approximately two-thirds of those charged by banks, and are used by the Japanese Fisheries Agency to further its policies for encouragement of certain fisheries and for redeployment of fishing effort from others; for example, last year financing of new vessel construction was concentrated on smaller boats (under 15 meters or 59 feet overall) as a measure for helping coastal fishermen, and this policy is being continued in 1958. Some recent developments in the Fund's activities are of indirect interest to the United States fishing industry. On July 26 the Minister of Finance and the Minister of Agriculture and Forestry approved modifications to the Fund's operating rules which will permit loans for certain new types of fishing boat equipment and for trout rear-

Japan (Contd.):

ing facilities. Under the new rules, loans may be made to individuals and companies, instead of being limited to fishery cooperatives, as in the past.

The new vessel equipment items covered by the Fund's loan program are inflatable life rafts, gyro-compasses, and weather chart facsimile receivers. These items are of particular interest to tuna boat operators, and applications amounting to nearly \$555,555 are expected in industry circles. For this type of equipment, loans can be made up to 80 percent of the cost to cooperatives and 60 percent to individuals and companies.

Of particular interest is the emphasis placed on trout rearing by the new loan regulations. Loans for this purpose have hitherto been restricted to cooperatives, but now loans of up to 80 percent of facility costs and \$2,700 may be made to individuals. Payment is to be made over a 10-year period. The reason for the encouragement of trout rearing is the increase in exports of trout in recent years and the belief that the trade has a promising future. In 1956, 508 metric tons of trout were exported, and in 1957 exports rose sharply to 847 tons, valued at \$729,710. The Japanese Fishery Agency believes that this trade, which is almost entirely to the United States, can eventually amount to 2,000 tons a year. (United States Embassy dispatch dated August 6, from Tokyo.)

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INTERIM REPORT ON FISH MEAL FACTORYSHIP OPERATIONS IN THE BERING SEA:

The fish-meal factoryship *Ginyo Maru*, which began working June 20 north of Dutch Harbor, as of August 5 produced 2,500 metric tons of fish meal, 100 tons of fish oil, and 30 tons of liver oil from a catch of 12,600 tons of Alaska pollock and flatfish delivered by her 20 trawlers. Current plans were to continue until mid-November, with a production goal of 10,000 tons of meal. Despite certain difficulties in quality control, and production and recovery rates (somewhat below original estimates), the operators and other Japanese fishing companies are interested in outfitting additional ships of this type.

On August 5 the *Ginyo Maru* (9,636 gross tons) had been out 60 days and on its fishing grounds in southwestern Bristol Bay since June 20. The current production rate was variously reported as 60 to 75 tons of meal, 5-6 tons of fish oil, and 1.5 tons of liver oil a day, from a catch of 300-400 tons of fish a day—a recovery rate of 17-18 percent. With recovery running below the planned rate of 20 percent and daily production below the planned 100 tons of

meal, the operators have apparently cut their target from 12,000 tons to 10,000 tons and intend to continue working until mid-November instead of quitting at the end of October, as originally scheduled.

The factoryship is supplied by 8 sets of pair-trawlers and 4 boats fishing independently with gear resembling the Danish seine. It appears that the pair trawlers are the more efficient of the two types. They fish close to the factoryship and pass the filled cod-ends of their trawls directly to the larger vessel for unloading, while the Danish seiners have to brail their fish aboard and then transfer them to the deck of the factoryship. The four Danish-type seiners work farther from the factoryship, on trips of up to one week's duration, and are used primarily for scouting new grounds. The pair trawlers take 3 to 5 tons in a drag and make up to 10 drags a day. The operators had counted on the catch composition including 60 to 70 percent Alaska pollock, said to produce meal of higher protein content than flatfish, but the percentage of this species was under 30 percent up to mid-July and has only lately risen to 50 to 60 percent. The pollock have been averaging 45-55 cm. (17.7-21.7 inches) fork length. The rest of the catch is a mixture of several species of flatfish.

The fish-meal plant (of Danish manufacture) is of the continuous process type in which screw conveyors and compressed air conveyors send the fish through the cooker, press, predrier, and revolving drier to the automatic weighing and bagging machinery in a matter of 3 hours. Along the way the stickwater from the press is centrifuged, concentrated, and added to the meal, increasing its protein content.

It was reported early in the operation that some trouble was being encountered because the very fresh fish delivered to the plant produced a meal that was too fluffy and light in proportion to its bulk. This is being remedied by leaving the fish on the deck of the factoryship up to 24 hours, which crowds the deck and delays the production process. Another difficulty has developed as it has been found that addition of the concentrated stickwater brings the salt content of the finished meal above the 2 percent allowed by present Japanese export standards. The operators have asked the Japanese Fishery Agency to modify the standards to permit 3.5 percent salt content in meal made aboard ship, and the Agency is reportedly ready to make this change if the operators can certify that European buyers will accept meal of this quality.

A tanker delivered 1,800 tons of fuel to the *Ginyo Maru* on July 27 and then proceeded to San Francisco. Plans call for the tanker to make two trips between California and the fishing ground during the operation. The first carrier to take fish meal from the factoryship, the 3,600-ton *Eisei Maru*, arrived August 9. Transfer of meal to the carrier has been badly hampered by rough weather and rain.

The *Ginyo Maru* has reported being passed close aboard on four occasions by large Russian trawlers, one of which observed the fleet's work for two days from such short range that it had to be requested to get out of the way. Three of the four Russian boats had their gear under cover and showed no signs of recent fishing activity; the fourth had fish on deck.

Despite the evident difficulties met with in this new fish-processing enterprise, the operating company has approached the Japanese Fishery Agency for permission to outfit a second fish-meal factoryship. Japan's two largest fishing companies are also reported to have unofficially asked the Agency's approval of plans to enter the field. The Agency is inclined at present to discourage any expansion of high-seas fish-meal production until it is made clear from the *Ginyo Maru*'s experience that such enterprises can be made to pay. This type of operation has several tempting advantages from the Japanese point of view. It yields a product for export, utilizing a high-seas resource which is believed to be of great magnitude, which is little exploited at present, and which has not become the subject of international controversy. It also offers a chance for profitable fishing to small trawlers, with which Japan's home fishing grounds are overcrowded. On the other hand, the importation of the necessary machinery requires a large allotment of foreign exchange, and the world market for fish meal is unstable at present with fluctuating prices making the export prospects uncertain.

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Japan (Contd.):

FISHERY AGENCY REQUESTS
TWOFOOLD INCREASE IN 1959 BUDGET:

The Japanese Fisheries Agency has requested a total of \$13,545,288 for its fiscal 1959 budget as compared with the 1958 budget of \$7,804,630. Among the major items for which large increases are being asked are: fishery surveys and investigations, \$700,505 as compared with \$344,092 for 1958; measures to increase production in existing fisheries, \$3,352,975 as compared with \$826,867; \$981,356 for control and guidance of fisheries in distant waters and development of new fishing grounds, as against \$552,424; promotion of foreign-based fishing, \$172,800, as compared with only \$14,193; and measures to improve distribution and stabilize prices of fishery products, up to \$22,026 from \$21,074 in 1958.

The largest single item in the 1958 budget—\$1,693,943 for reinsurance of fishing vessels—is down to second place in the 1959 requests at \$1,552,010. Construction of research and patrol craft, for which \$648,138 was budgeted in 1958, continues to be a large item, with \$844,983 requested.

There are several interesting new items in the proposed 1959 budget. Among them are \$124,090 for assistance to the prefectural fishery experiment stations, to enable them to improve their research facilities; \$105,420 for aerial surveys of the coasts to provide basic data for preventing tsunami and typhoon waves damage; and \$85,000 for a central fishery radio station to be installed atop the Agriculture and Forestry building in Tokyo. This station will enable the Agency to keep in direct touch with its 40-odd patrol craft and with its inspectors aboard motherships, as well as to broadcast warnings of typhoons, radioactive fallout, and other emergency matters to the farflung Japanese fishing fleets, an August 21 dispatch from the United States Embassy in Tokyo reports.

FISHING INDUSTRY TO ADOPT METRIC
SYSTEM AND STANDARDIZE FISH BOXES:

All Japan is scheduled to go on the metric system on January 1, 1959, after which date the traditional "shaku" and "kan" units of measurement will have no legal status,

and the manufacture and sale of instruments calibrated in these units will be prohibited. The Japanese Fishery Agency has ordered the metropolitan central wholesale fish markets of the country to lead the way in this drastic change by adopting the metric system on September 1 of this year. After that date, prices are to be quoted in terms of kilograms and the monthly reports, which the central markets are required by law to submit, will show the volume of their business in metric units. This drastic departure from tradition is being greeted with considerable misgivings by people in the fisheries trade, many of whom depend for their livelihood on their ability to make rapid judgments to buy or sell at prices quoted in the familiar terms of yen per kan. In general, however, the dealers in fishery products appear to be making a conscientious effort to adopt the metric system.

The Japanese Fisheries Agency has used the changeover to the metric system as an opportunity to attempt to establish a nationwide standardization of dimensions for fish boxes. The Fisheries Society of Japan formed a committee of 40 industry representatives in April 1958 to consider this problem, and after due deliberation they arrived at a preliminary plan in May, recommending an array of 10, 15, 20, and 30-kilogram (22, 33, 44, and 66-lb.) boxes and 35-kilogram (77-lb.) tubs. This plan was strongly opposed in parts of the country where the receptacles traditionally used for fish did not fit well into the proposed standards, and regional committees were set up to see whether plans acceptable to each region could be formulated, with the hope of later working these regional plans together into a national standard. The work of the committees seems to be encountering considerable difficulty. Among the objections to standardization, other than long-established custom, is the fact that the boxes in use at present are adapted to the dimensions of fishing vessel holds, railway freight cars, and the sizes of pans used for freezing fishery products, so that changes in box measurements would entail many other costly changes.

FISH MEAL FACTORYSHIP
OPERATIONS IN THE BERING SEA:

Current operations of the Japanese fish meal factoryship *Ginyo Maru* (9,600 tons gross) in the Bering Sea are attracting attention in industry circles as the first such Japanese venture since the war. The ship, formerly the Finnish cargo vessel *Vassa*, has been equipped with a continuous production fish meal plant of Danish manufacture at a reported cost of over \$190,000.

Departing from Yokohama on June 8, the *Ginyo Maru* reached its initial operating position north of Unalaska (at 56°41' N., 165°15' W.) on June 20 and began receiving Alaska pollock and flatfish from its fleet of 20 trawlers of 80-120 ton size. Fishing is scheduled to continue until November 5, with a production goal of 12,000 tons of fish meal. The meal plant has a rated capacity of 100 tons a day, but up to July 3 it had been operating at less than 70 percent of capacity, and production as of that date was 650 tons, according to a dispatch from the U. S. Embassy in Tokyo, dated July 29, 1958.

Japan (Contd.):

The Ginyo Maru carries two technicians who are checking the operation of the fish meal plant, an inspector from the Japanese Fisheries Agency, who is collecting biological data on the fish taken, and an inspector from the Export Inspection Office, who tests the fish meal for compliance with the import standards of its intended market, West Germany.

An agreement has been made for the Ginyo Maru to operate during the 1958/59 Antarctic whaling season with the Netherlands' vessel, William Barentz, from which it will buy whale meat for processing into meal for sale in Western Europe. The plan includes stationing 25 men from the Ginyo Maru aboard the Barentz to prepare the whale meat for reduction.

The Ginyo Maru has reported considerable fishing traffic in northern waters. The vessel has passed through much of the Japanese salmon mother-ship fleet, been in radiotelephone contact with the sperm whaling fleet about 140 miles to the southwest of its initial operating position, and been hailed by a Russian trawler on the fishing grounds.

A Japanese company, other than the one operating the fish meal factoryship, has a fleet consisting of the 535-ton Uji Maru, two 100-ton trawlers, one 60-ton gillnetter, and a 500-ton carrier working in the Olyutorsk area northeast of Kamchatka. This fleet is scheduled to operate for a period of 103 days between May and September, with a production goal of 1,700 25-pound boxes of frozen king crab and 34,150 boxes of cod fillets. The company fished this area the year before last, but made no money, and did not send a fleet there in 1957. This year's operation is viewed as a move to hold on to the rights to the ground. Up to June 21 a production of 50 tons of frozen crab meat was reported, but cod fishing was said to be poor and the operators were counting on the herring fishing from July on to bring up the fleet's over-all catch.

As an activity to fill in the time from the end of salmon fishing to the begin-

ning of the Antarctic whaling season, three Japanese firms have sent mother-ship fleets out for flatfish in the Bering and Okhotsk Seas since 1954. Production is aimed at providing low-priced food fish for the domestic market. In 1957, four fleets were sent to the Bering Sea and two to the Sea of Okhotsk. Although they produced over 22,000 tons of flatfish, prices were low and no profits were made. In view of the intensive fishing being done this year by the Ginyo Maru fish meal fleet in the Bering Sea, and the poor financial record of the flatfish fishery, it is expected this year that only two or three fleets will take part in the flatfish fishery and that operations will be concentrated more in the Sea of Okhotsk than in the Bering Sea.

In an attempt to develop new fishing grounds for small trawlers, the Japanese Fisheries Agency is sponsoring trawling for cod and flatfish by 20 vessels from Hokkaido and northern Honshu in waters of the northern Kuriles and the central Maritime Province during July-September. The fleet will be accompanied by research vessels.

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FOREIGN FISHERIES DEVELOPMENTS:

The Japanese fishing industry, with its overcrowded home waters, its great reserve of skilled and hardy fishermen, and its powerful diversified fishing enterprises, is an enormous reservoir of potential fishing effort, ready to flow out into any part of the world's seas where the natural resources and the absence of political or economic barriers offer even a slight hope of success. The considerable pressure within this reservoir is constantly expressed in plans for new overseas bases, joint operations with foreign interests, and exploration of distant fishing grounds, reports a dispatch from the United States Embassy in Tokyo, dated July 24, 1958.

According to trade sources, Japanese Fishery Agency budget drafts for the fiscal year 1959 show greatly increased support for overseas fishery expansion, preliminary figures indicating an increase of 40 times, from ¥5 million (US\$13,800) in 1958 to over ¥200 million (US\$555,555) in 1959. Projected items include increased financial assistance to the Kaigai Gyogyo Kyoryoku Kai (Overseas Fisheries Cooperation Association), stationing of representatives abroad, and sending an advisory group to Thailand and survey groups to Singapore, Malaya, and Africa. In view of the difficulties encountered in the past by small operators in getting into overseas operations, about ¥80 million (\$222,000) is planned for assisting with their fuel and fishing gear expenses.

In Southeast Asia, the Japanese Overseas Fisheries Cooperation Association is reported to be planning establishment of a corporation to engage in joint tuna fishing enterprises with interests in Singapore and Malaya. The Singapore project, which is scheduled for realization first, envisages refrigerated storage for 500 tons, ice-making capacity of 30 tons, freezing capacity of 20 tons, and a cannery, to be supplied by a fleet of ten 100- to 150-ton tuna vessels. Meanwhile, the long-heralded plan for a tuna vessel base at Tarutau Island in Thailand appears to be bogged down with financial difficulties. Under pressure from tuna fishermen's leaders, the Japanese Fisheries Agency came up

Japan (Contd.):

with a new plan during June 1958, which would cut down construction time from 3 to 2 years, and the Agency is at present working on financial plans to be presented to the Finance Ministry. The possibility of using private United States capital has been mentioned in connection with the Tarutau project.

An operating plan for a non-tuna fishery enterprise for trawling off Australia was recently submitted for Fisheries Agency approval. The operation would use one 1,000-ton trawler and two 100-ton pair trawlers on fishing grounds (at 14°-22°S., 114°-125°E.) off northwestern Australia, during September-October 1958. Production goal would be 26,000 boxes of frozen round and filleted "sea bream" of several species. The Japanese Fisheries Agency is reported to have found no obstacle to the operation in Australian fishery law, but is hesitating to approve the plan because the proposed fishing ground overlaps the pearling grounds by some 10 miles. This could cause difficulties with Australia, which claims jurisdiction over the pearl oyster resources of the continental shelf.

In the Middle East, a Japanese-Swiss enterprise based at Haifa, Israel, was expected to materialize with the signing of a contract in the latter part of July. The enterprise plans to use one 500-ton tuna long-liner to deliver 1,000 tons of fish a year for consumption within Israel.

Considerable activity by Japanese fishing interests is reported from the Atlantic and Caribbean areas. In Recife, Brazil, completion ceremonies were held recently for a new Japanese-Brazilian seafood processing plant. The plant is reported to have a 1,000-ton refrigerated storage capacity, a 20-ton ice-making plant, a 10-ton freezing capacity, a cannery capable of producing 500 cases a day, and a sausage factory with an output of 30,000 pieces of Japanese-style fish sausage a day. The firm reportedly has under contract 3 Japanese tuna-fishing vessels working out of Recife being serviced by a freezer ship. Great hopes are held for future expansion of the tuna industry in Recife, especially for export.

For the Caribbean area, it is reported that several large tuna long-liners will supply fish to a United States cannery in Puerto Rico after first landing the fish in Haiti. Speculation is that volume will amount to about 2,000 tons a year. Meanwhile, another firm is said to be planning similar indirect exports to Puerto Rico through the Dominican Republic, the tuna to be supplied by vessels of a firm operating in the Atlantic. It is pointed out that large yellowfin tuna (over 100 lbs.) from grounds off Brazil are selling for US\$330 a short ton, gilled and gutted, on the United States east coast as compared with only US\$220-250 in the Italian market.

In the South Pacific area, representatives of Japanese fishing and trading firms associated with United States and local interests in Espiritu Santo, New Hebrides, were to inspect the activities of their tuna fishing venture. It is reported that 50 percent of the capital in this enterprise, which started last October with 8 fishing boats and a cold storage plant, is Japanese. The visit of the Japanese businessmen is believed to portend expansion of the refrigeration facilities and possible development of fisheries other than tuna. Present annual production schedule is said to be 3,000 tons of tuna (about 60 percent albacore). Experimental fishing for shrimp and pearl shell is under way, and there are possibilities of establishment of a diversified fishing base.

The Japanese fisheries press has recently reported that negotiations are under way to bring two more ICA-financed Korean tuna long-liners into operation at Samoa to join the one which has been supplying fish to the United States-owned cannery there since last autumn. Plans for bringing tuna boats from Hawaii into the Samoan fishery are also reported. With the Japanese government said to be reluctant to increase the amount of tuna that Japanese vessels are allowed to land at Samoa (said to be 10,000 tons a year), there is fear that any future expansion of production there will bring increased participation of non-Japanese vessels in the operation.

Announced exploratory fishing plans for the Japanese Fishery Agency's 600-ton tuna research ship Shoyo Maru in 1959 include working from January-March in the Australian area, especially the Great Australian Bight. From June-November 1959, a cruise will be made to the Caribbean,

with calls scheduled at Honolulu, Panama, Santo Domingo, Venezuela, Haiti, Cuba, Ecuador, and Peru. Meanwhile, the Shoyo Maru was scheduled to sail July 22, 1958, on a 72-day tuna long-lining trip to survey tuna resources in Hawaiian waters. It is explained that the concentration of fishing vessels in that area is relatively light and fishing there would not entail competition with United States fishermen.

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KING CRAB CANNERY SHIP COMPLETES 1958 SEASON IN THE BERING SEA:

The single crab cannery ship, the Tokei Maru, working in the Bering Sea (Bristol Bay area) this year, returned to Hakodate on July 11, 1958, after 97 days at sea and 72 days on the fishing grounds. The ship's pack, as had been predicted, was 59,850 cases of first-grade king crab, equalling the 57,000-case production quota plus the customary 5 percent leeway allowed by the Japanese government. It was reported that the crabs were larger than last year, but that the catch rate, 11.4 crabs per tan of net, was slightly less. The fact that the catch quota was completed several days earlier than in 1957 and nearly a month earlier than in 1956 indicates a healthy state of the resource.

The Tokei Maru left Hakodate on July 16 for Yokohama, where the pack will be unloaded. The pack includes 30,084 cases of 1-lb. cans, and 29,765 cases of ½-lb. cans of king crabs, and 376 cases of red crab, states a July 30, 1958, dispatch from the U. S. Embassy in Tokyo.

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FOREIGN TRADE IN MARINE OILS, 1956-57:

Exports by Japan of marine-animal oils totaled 74,772 metric tons in 1957,

Table 1 - Japanese Imports and Exports
of Marine-Animal Oils, 1956-57

Type of Oil	Imports		Exports	
	1957	1956	1957	1956
	... (Metric Tons) ...			
Liver Oils:				
Cod	116	9	2,230	2,684
Shark	59	45	434	803
Other fish	100	69	552	475
Body Oils:				
Fish	1	4	4	563
Whale ^{1/}	81	13	22,448	60,955
Sperm ^{2/}	-	-	49,104	13,349
Total	357	140	74,772	78,892

^{1/}From baleen whales.

^{2/}Excluding oil from baleen whales.

Japan (Contd.):

a decrease of 5.5 percent as compared with the 78,892 tons exported in 1956. The decrease was due primarily to a

porters of all types of Japanese marine oils in both 1956 and 1957. The United States was the most important importer of Japanese cod-liver oils in both 1956 and 1957. During 1957, the United States

Table 2 - Japanese Exports of Marine Animal Oils by Country of Destination, 1956-57

Country	Cod-Liver Oil		Shark-Liver Oil		Fish-Liver Oil		Fish Oil		Whale Oil		Sperm Oil		Totals	
	1957	1956	1957	1956	1957	1956	1957	1956	1957	1956	1957	1956	1957	1956
	(Metric Tons)													
United States . .	1,991	2,101	117	102	254	244	-	-	-	-	9,787	2,362	12,234	12,234
Canada	77	45	13	91	29	30	-	-	-	-	-	119	166	166
Norway	78	337	66	350	8	19	-	-	-	-	-	152	706	706
Sweden	23	14	12	-	18	17	-	-	-	-	5,080	5,133	31	31
United Kingdom . .	8	13	30	21	44	34	-	-	16,728	11,322	3	11,404	16,799	16,799
Netherlands . . .	8	54	9	100	35	15	-	-	9,035	21,688	1,999	19,575	23,856	23,856
France	18	54	49	40	98	51	-	-	-	-	-	165	145	145
West Germany . .	-	4	-	-	-	-	563	10,819	22,539	19,345	1,560	30,164	24,666	24,666
All others	27	62	138	99	66	65	4	-	2,594	2,869	-	5,698	226	226
Total	2,230	2,684	434	803	552	475	4	563	22,448	60,955	49,104	13,349	74,772	78,829

decline in the exports of oils derived from whales.

West Germany, the Netherlands, and United Kingdom were the largest im-

ported about 3.2 percent of Japanese exports of marine-animal oils as compared with 15.5 percent in 1956.

SCALLOP PRODUCTION:

Of Japan's total scallop production, normally about 75 percent is landed in Hokkaido and most of the remaining 25 percent is landed in the Matsu Bay area at the northern tip of Honshu. The total scallop production in 1957 amounted to 33.4 million pounds of which 333,283 pounds were dried and 632,025 pounds were frozen for export.

In Hokkaido, scallop fishing for 1958 began on July 11. Estimates of 1958 production by the Hokkaido Federation of Fishery Cooperatives and the Hokkaido Government Fishery Products Section are 24.9-29.4 million pounds raw weight. The estimate is said to represent a decrease of about 10 percent as compared with the 1957 landings. Production plans for processed scallop products include about 399,000 pounds of dried scallops (as compared with 571,900 pounds last year), 660,000 pounds frozen, and 48,500 cases canned. There are said to be 242 powered vessels, 222 nonpowered vessels, and 1,550 fishermen engaged in the Hokkaido scallop fishery.

Hokkaido producers are reportedly worried over the effect on the market of

expected heavy landings from Mutsu Bay, where fishing began on June 15, 1958. This area is estimated to have produced about 6.6 million pounds in June and July, with a forecast catch for the 1958 season of 15.8 million pounds. This extraordinarily large production is ascribed to measures taken by the government in the past few years to revive the scallop resource of Mutsu Bay, according to a dispatch from the U. S. Embassy in Tokyo, dated August 6, 1958.

SOME NEW DEVELOPMENTS IN FISHING VESSEL CONSTRUCTION:

Several interesting reports on new vessels have appeared recently in the Japanese fisheries trade press. The first of two 2,000-ton freezer-cannery ships built under the Philippine reparations program was launched on June 30. Christened the *Magsaysay*, the vessel has a fish-hold capacity of 350 metric tons, ice-making machinery for 10 tons a day, and canning equipment capable of turning out 840 cases of fish a day. The *Magsaysay* was built at a cost of over US\$1 million, and is equipped with freon refrigeration, radar, radio-direction finder, and echo-sounder. Main engine horsepower is given as 1,500 and speed as 10 knots. The ship is scheduled for completion and delivery in mid-September, and will be used for sardine and skipjack canning based at Iloilo, Philippine Islands. A sistership, the *Estancia*, is to be launched at the end of August. Each of these vessels are to carry a crew of 24 and a cannery force of 153 workers. Negotiations are under way to employ Japanese cannery technicians on these ships.

Japan's first and largest commercial stern trawler, the 1,500-ton *No. 51 Taiyo Maru*, returned from her

Japan (Contd.):

first trawling cruise on June 21 with about 500 tons of frozen sea bream. The vessel, which served as a refrigerated carrier ship in the last Antarctic whaling season, was completed last fall, its construction having been inspired by the large German stern trawlers. On her first dragging cruise, the *Taiyo Maru* fished in the Gulf of Tonkin from April 1 to June 15. The ship's officers reported that the stern trawling system was particularly good in rough weather and that less gear was lost than with side trawling. They expressed the opinion that a trawler of this type could be built up to 3,000 tons and operate efficiently. The *Taiyo Maru* sailed for a second trip in the Gulf of Tonkin on July 5.

The 1,200-ton *Koyo Maru*, a new training ship built for the Japanese Government's Shimonoseki Fisheries Institute as a replacement for the 588-ton *Shunkotsu Maru* was launched on June 19. Constructed at a cost of US\$1,166,000, the *Koyo Maru* is 218 feet long, has 45 cubic meters of fish holds, will make 14 knots speed, and is equipped with an active rudder. The ship is expected to be completed early in September, and in October will take 45 fourth-year students of the Institute out for training in tuna fishing. The destination of the *Koyo Maru's* maiden voyage is reported as southeast of Hawaii and the Tasman Sea. (United States Embassy dispatch from Tokyo, dated July 29, 1958.)

TUNA BOAT OWNERS' FEDERATION REVEALS PLAN FOR BASE IN THAILAND:

With the Japanese Fishery Agency reportedly still examining a plan for the long-awaited tuna fishing base at Tarutau Island, Thailand, the Federation of Tuna Fishing Associations has made public the plans worked out by its own Advanced Base Promotion Committee, apparently in the hope of spurring the government on to a speedier decision on the project. The boat owners' plan envisages the setting up of an investment company in Japan, with paid-in capital of \$5.8 million, including government funds, to take charge principally of the construction of shore facilities.

A joint Japanese-Thai company would be established in Thailand with paid-in capital of \$1.38 million (51 percent from Japan, 49 percent from Thailand) to operate the shore facilities and handle the sale of fish and processed products. At the start, the boat owners' federation would contract to the joint concern 50 medium-sized tuna vessels, a number which they consider the minimum that would make participation in the project worthwhile for them. Under an agreement to be made with the Thai government, the company would supply fresh and frozen fish to the Thai armed forces and other consumers within the country,

while the canned tuna produced would be exported. Manufacture of fish sausage and fish meal is also planned. (United States Embassy dispatch from Tokyo, August 28, 1958.)



Kenya

JAPANESE TUNA FISHING OFF EAST AFRICA:

Japanese fishing vessels operating in the Seychelles and Madagascar area obtain their provisions at Mombasa. All vessels have full refrigeration facilities and load their catches, chiefly tuna and shark, into a mothership which ferries the fish back to Japan. No attempt appears to have been made to dispose of any of the catch in East Africa, and no Japanese fishing vessels have been operating in East African territorial waters, reports the United States Consulate at Nairobi in an August 15 dispatch.



Lebanon

IMPORT DUTY ON FISHING NETS, ETC., AMENDED:

An amendment to the Lebanese customs tariff, item No. 567--fishing and hunting nets, net bags, and other similar nets became effective on June 16, 1958, states a dispatch from the U. S. Embassy at Beirut dated July 15, 1958. Under this decree (No. 732, dated June 13, 1958), fishing and hunting nets, made of any material, are assessed 25 percent ad valorem under maximum tariff, and 11 percent under normal tariff. Formerly, only such nets made of cotton were so assessed, while those made of other materials were subject to 50 percent and 25 percent duty, respectively.



Libya

EXPORT DUTY ON SPONGES INCREASED:

The export duty on sponges was increased from 110 milliemmes (31 U. S.

Libya (Contd.):

cents) to 150 milliemmes (42 U. S. cents), by the Libyan Customs Directorate on July 31, 1958, states a dispatch from the United States Embassy in Tripoli, dated August 4, 1958.

TRIPOLITANIA'S TUNA SEASON DISAPPOINTING:

Tripolitania's tuna fishing season through July 26 has proved very disappointing. A series of local storms and prolonged rough seas have handicapped the fishing vessels, while a particularly violent squall completely demolished one large "tonnara" net system at Zuara. Current reports indicate that the tuna catch will fall below the 1956 and 1957 levels despite the very promising beginning made in late May. (United States Embassy dispatch from Libya, dated July 28, 1958.)



Mexico

ENSENADA FISHERY PRODUCTS PRODUCTION, 1957:

The principal species of fish landed in the Ensenada area of the Mexican west coast were sardines--17.9 million pounds. The largest quantity of crustaceans landed were 5.7 million pounds of abalone and 2.2 million pounds of spiny lobster.

Ensenada's Production of Fish, Crustaceans, and Other Marine Products, 1957			
Species	Quantity 1,000 Lbs.	Species	Quantity 1,000 Lbs.
Abalone . . .	5,734	Sardine . . .	17,924
Spiny lobster .	2,207	Mackerel . .	2,339
Clam	507	Tuna	890
Mussel	8	Rock cod . .	131
Abalone shells	131	Pollock . . .	88
Conch shells .	20	Corbina . . .	32
Marine snail .	2	Barracuda . .	30
Sargasso . . .	22,046	Jurel	11
Marine algae .	152	"Berrugata" .	9
Fish meal . . .	2,380	Anchovy . . .	6
Fish oil	375	Mudsnucker .	2
Fish fertilizer .	402	Marine turtle	436

In addition to the above, small catches were reported of flounder, smelt, roncador, pompano, sole, shark, cod, bonito, red snapper, and white fish.

The Ensenada canneries are reported to be operating at par, and recently the local press has urged the establishment of additional canneries farther south in the peninsula, closer to the fishing grounds, states a July 2 dispatch from the United States Consulate at Tijuana.

MERIDA SHRIMP FISHERY

TRENDS, APRIL-JUNE 1958:

The east coast Mexican shrimp fishing industry, operating from the Merida area, exported approximately 3.7 million pounds of shrimp during April-June 1958 as compared with 3.9 million pounds for the same period in 1957. All exports of shrimp were made to the United States, according to a dispatch (July 25, 1958) from the United States Consul in Merida.

Heavy weather during the months of January, February, and March caused the fishing fleet to remain in port for extended periods of time, causing a considerable loss in catch and in the production of frozen shrimp for export. Many owners of fishing vessels have not yet financially recovered their losses. This fact, along with reported small catches made during the present quarter, is causing a serious economic repercussion within the industry. If the situation further deteriorates, there is speculation that there may be a complete collapse in the industry.

It is believed that approximately 20 percent of the shrimp catch is being sold illegally and that roughly 90 percent of local crews are engaged in this activity.



Netherlands

ELECTRIC CABLE FOR TICKLER CHAIN USED BY TRAWLER OWNERS:

A Netherlands fishing trawler owner has developed and intends to patent a new method of electric trawl fishing, according to local news sources, states an August 14 dispatch from the United States Embassy at The Hague.

The method provides an electric cable replacement for the tickler chain, which is usually attached to the mouth of the standard trawl net, and which by scraping on the sea bottom serves to scare the fish into the net. The cable produces an electric current in front of the trawl opening which not only scares fish into the net more effectively but also prevents them from leaving the net. In addition to increased catches the new device serves to reduce the net load drawn by a trawler since the electric cable does not touch the sea bottom.

A trawler out of the port of IJmuiden was expected to conduct experimental

Netherlands (Contd.):

fishing with the new rig in the North Sea early in September.

EXPORTS OF SALTED HERRING TO ISRAEL TO BE INCREASED:

The Netherlands Association of Herring Dealers in IJmuiden has concluded a 1 million guilder (US\$263,000) contract with Israel for the supply of more than 22,000 barrels of salt herring. The fish will be shipped between October 1958 and March 1959. At the present time there is an excess stock of herring in The Netherlands and the Association is presently negotiating with the East Germans to dispose of some of this stock, states an August 19, 1958, dispatch from the United States Consul in Amsterdam.

IMPORTS OF JAPANESE CANNED SALMON DECREASED FIRST SIX MONTHS OF 1958:

Netherlands imports of Japanese canned salmon during January-June 1958 dropped sharply to only 292 metric tons—a decline of approximately 75 percent as compared with the 1,177 tons imported during the same period in 1957. A large part of the canned salmon from Japan is repackaged and exported to France, states a dispatch from the United States Embassy at The Hague, dated August 11, 1958.

Netherlands orders for canned salmon have not been placed in Japan pending the receipt of price quotations of United States and Canadian salmon. It is reported that price will be the most important factor determining where Netherlands importers place their orders.

Netherlands Imports of Canned Salmon, January-June 1958

Source	January-June 1958		January-June 1957	
	Quantity	Value	Quantity	Value
	Metric Tons	US\$ 1,000	Metric Tons	US\$ 1,000
Japan	292	268.8	1,177	1,007.7
Canada	247	215.7	96	121.1
United States ..	51	61.8	94	146.2
Other	25	27.0	7	6.6
Total	615	573.4	1,374	1,281.6

Note: Value converted at rate of 3.783 guilders equal US\$1.

SHRIMP AND HERRING FISHERIES TRENDS:

The herring fishery in the Netherlands has yielded 120,539 barrels of salted herring so far this year as compared with 71,090 barrels for the same period in 1957 and 117,776 barrels in 1956. Exports of lightly-salted herring

to Belgium, Germany, and Norway have been good, according to a July 28 dispatch from the American Consulate at Rotterdam.

The catch of shrimp (Garnalen) so far this year has been very poor, amounting to 2,233,260 pounds as compared with 5,831,167 pounds for the same period in 1957 and 7,716,100 pounds in 1956.



Nicaragua

SHRIMP FISHERY BEING DEVELOPED:

Shrimp fishing, the latest industry in Nicaragua, has so far attracted a number of fishing vessels and there is the possibility that even more will participate. The vessels now fishing from Nicaragua are operated by 6 United States companies, 1 French company, and 3 Nicaraguan companies. All now operate under temporary licenses that permit them to export their catches without foreign exchange restrictions.

Interest in fishing concessions—especially shrimp fishing—in Nicaraguan territorial water has increased considerably since approval by the Nicaraguan Congress of the General Law on Exploitation of Natural Resources (Ley General Sobre Explotaciones de Recursos Naturales), published April 17, 1958. As of July 15, 1958, the Office of Natural Resources of the Ministry of Economy, which issues all types of concession licenses, had granted ten exploration licenses to fishing companies. These exploration licenses were issued originally for six months, but recently, the Office of Natural Resources decided that no exploration license would be valid after December 15, 1958. After that date, permanent exploitation licenses will be granted.

The purpose of a temporary exploration license, which is granted free, is to give the licensee an opportunity to become familiar with the nature of the fish species and other marine fauna existing in Nicaraguan territorial waters. In return, the licensee must keep records of his operations and findings and give a

Nicaragua (Contd.):

copy of them to the Office of Natural Resources. The copies will be used by the Office of Natural Resources as the basis for the beginning of an inventory of the country's marine resources.

The Director of the Office of Natural Resources stated that in order to obtain an exploitation license after December 15, 1958, the applicant must show evidence of an intention to establish permanent installations on the Nicaraguan mainland to process his catches. The number of vessels that each applicant will be authorized to use will be in relation to the capacity of his proposed land installation. As of July 15, thirteen vessels were being operated by companies holding exploration licenses, but there is a possibility that this number will increase to 35-40 by December 1, 1958.

Firms now holding exploration licenses are free to export their catches without restriction. The National Bank of Nicaragua does not require that foreign exchange earned from the sale of fish caught during the temporary exploration period be surrendered for cordobas in exchange for an export license, although normally all foreign exchange earned by Nicaraguan exports is surrendered to the bank for cordobas.

Licenses permitting the exportation of 40,000 pounds of shrimp had been issued to a United States firm by July 1, 1958. This firm expects to be landing a daily average of 10,000 pounds of shrimp within a short time, according to a dispatch from the U. S. Embassy in Managua, dated July 31, 1958.



Norway

BALANCE OF ANTARCTIC WHALE-OIL STOCKS SOLD:

The Chairman of the Norwegian whaling companies' marketing organization has recently announced that the balance of the stocks of unsold whale oil from the 1957/58 Antarctic whaling season, some 68,000 metric tons, has been sold

at the price of £67 10s. a metric ton (8.6 U.S. cents a pound) to Norwegian refining companies. Earlier this year, about 54,000 metric tons had been sold for £77 10s. a ton (9.8 cents a pound), making the average price obtained for last season's whale oil production just under £72 a metric ton (9.1 cents a pound) as compared with the average of £85 (10.8 cents a pound) obtained during the last two previous seasons.

Recent sales of whale oil by the United Kingdom and Japan have reduced unsold Antarctic whale oil stocks to between 20,000 and 30,000 metric tons. (Oslo United States Embassy dispatch, July 22, 1958.)

BULK-STORED FISH MEAL TESTS SUCCESSFUL:

Experiments indicating that fish meal can be stored successfully in grain silos have recently been completed in Norway. A report on the tests suggested that on the basis of the results, other types of protein feed might be stored in bulk.

The experiments were carried out to analyze changes in the quality of herring meal bulk-stored in silos, and to compare its quality with that of herring meal stored in paper bags. Feeding tests were made after the storage period to determine the meal quality.

The tests compared herring meal of extra quality, whole meal, and whole meal of unground type. The meal of extra quality was stored in a silo for 13 months, the whole meal for 21 months, and the unground type for 19 months.

Results of the silo-bag storage comparison indicated that there was a reduced content of dry matter in the meal stored in paper bags. On the other hand, the tendency towards formation of free fatty acids was more dominant in the meal stored in silos. There was no other difference in the chemical composition of the meal stored by these two methods.

In regard to the physical quality of the meal, bulk storage in a silo seems to be more advantageous because lumping can be avoided more easily by rotation.

Norway (Contd.):

Bulk storage and storage in paper bags seem to have largely the same effect on the quality of the herring meal. The report mentioned, however, that with silo storage a more uniform quality of herring meal is realized.

Quantities of whole meal bulk-stored in silos and stored in paper bags were used for feeding experiments with pigs and chickens. These experiments showed no difference regarding the rate of growth of the animals and the quality of the slaughter. (Feedstuffs, August 9, 1958.)

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CANNED FISH TRENDS, JULY 1958:

The Norwegian 1958 pack of brisling sardine as of July 19 totaled 180,600 cases, a decline of 239,000 cases from the pack of 419,600 cases during the similar period of 1957. The decline in the pack of brisling is attributed to poor fishing rather than to economic conditions. On the other hand, the pack of small or sild sardines has shown some improvement--309,000 cases as of July 19, 1958, compared with 257,000 cases through July 19, 1957.

Exports of canned fish to the United States (largest importer of Norwegian canned fish products) amounted to 3,190 metric tons from January-April 1958. This compares with 3,574 tons exported to the United States during the same period of 1957, the United States Embassy in Oslo reports in an August 22, 1958, dispatch.

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POSITION ON EXPANSION OF TERRITORIAL FISHING LIMITS:

Norway's disapproval of unilateral actions as they concern expansion of territorial fishing limits was defined again in a statement of August 1, 1958, by the Norwegian Foreign Minister.

He pointed out that Norway's interests require that an expansion of the now valid fishery boundaries take place by international negotiations which can lead to a world-wide agreement on this

question. The Foreign Minister stated that "Norway hoped the United Nations General Assembly this fall will decide to call a new conference early in 1959, and that this conference will reach an agreement on the principle which will serve as the basis for future changes in the fishery limits. It is the Government's view not to undertake anything as far as the Norwegian fishery limit is concerned before it is clear whether the United Nations will call a new conference together and before it is clear whether it will achieve results."

The Norwegian Foreign Minister continued: "Only if an actual critical situation should arise along our coast this winter as the result of a mass invasion of foreign trawlers which have been excluded from the fishing places westward in the ocean could the Government be forced to deviate from the lines it desires to follow in this matter" (United States Embassy dispatch from Oslo, dated August 2, 1958).



Peru

FISHERIES TRENDS:

Peru's fishing industry is normally inactive during the second quarter of the year except for supplying domestic consumption. The 1957/58 fishing season was so adversely affected by warm ocean currents that there was no noticeable drop in activity at the end of the season. Beginning in June, however, the irregular condition of the coastal waters resulted in a large concentration of tuna off Chimbote and Piura (unique for this time of the year) that provided heavy catches for some 30 United States-based tuna boats as well as for Peruvian boats.

Principal Peruvian Fishery Products Exports, January-May 1958				
	Jan.-May 1958		Jan.-May 1957	
	Qty.	Value	Qty.	Value
	Metric Tons	1,000 US\$	Metric Tons	1,000 US\$
Canned bonito	4,819	1,764	9,168	4,700
Fish meal	39,152	3,894	22,331	2,684
Frozen tuna	1,773	194	3,714	453
Frozen skipjack. . . .	692	75	2,291	274
Sperm oil.	3,708	542	1,723	321

Note: Values converted at rate of 19 soles equal US\$41 for 1957; from January to May 1958 the rate changed to 22.7 soles equal US\$1.

In the beginning of the 1957/58 season, Peruvian canned bonito and tuna suffered from Japanese competition, particularly in the British market, but as the season progressed supplies of fish were so limited that Peruvian canneries were unable to supply the demand. Frozen tuna, all of which is exported to the United States, was also short due to adverse fishing conditions.

Although exports of canned bonito and canned and frozen tuna declined, exports of fish meal and sperm oil increased. It is estimated that Peru will produce 10,000 metric tons of sperm oil in 1958. (United States Embassy at Lima reports in a July 18, 1958, dispatch.)



Portugal

CANNED FISH EXPORTS, JANUARY-MAY 1958:

Portugal's exports of canned fish during January-May 1958 amounted to 22,027 metric tons (1,380,000 cases), valued at US\$12.1 million, as compared with 17,143 tons, valued at US\$10.9 million, for the same period in 1957. Sardines in olive oil exported during the first five months of 1958 amounted to 15,397 tons, valued at US\$8.4 million.

Portuguese Canned Fish Exports, January-May 1958		
Species	January-May 1958	
	Metric Tons	US\$ 1,000
Sardines in olive oil	15,397	8,433
Sardinelike fish in olive oil	2,619	1,815
Sardine & sardinelike fish in brine	421	105
Tuna & tunalike fish in olive oil	610	480
Tuna & tunalike fish in brine	207	99
Mackerel in olive oil	2,284	1,049
Other fish	489	151
Total	22,027	12,132

During January-May 1958 the leading canned fish buyer was Germany with 3,363 tons (valued at US\$1.9 million), followed by Italy with 3,028 tons (valued at US\$1.6 million), Great Britain with 2,519 tons (valued at US\$1.3 million), the United States with 2,070 tons (valued at US\$1.5 million), and Belgium-Luxembourg with 1,740 tons (valued at US\$0.9 million). Exports to the United States included 740 tons of sardines and 1,081 tons of anchovies. (*Conservas de Peixe*, July 1958.)

CANNED FISH PACK, JANUARY-MARCH 1958:

The total pack of canned fish for January-March 1958 amounted to 3,921 metric tons as compared with 3,823 tons

Portuguese Canned Fish Pack, January-March 1958		
Product	Net Weight	
	Metric Tons	Canners' Value US\$ 1,000
In Olive Oil:		
Sardines	1,994	1,124
Sardinelike fish	222	105
Anchovy fillets	970	858
Tuna	352	267
Other species (incl. shellfish)	98	70
In Brine:		
Sardinelike fish	155	23
Other species	130	54
Total	3,921	2,501
Note: Values converted at rate of 28.75 escudos equals US\$1.		

for the same period in 1957. Canned sardines in oil (1,994 tons) accounted for 50.9 percent of the January-March 1958 total pack, higher by 11 percent than the pack of 1,797 tons for the same period of 1957, the July *Conservas de Peixe* reports.

FISHERIES TRENDS, MAY 1958:

Sardine Fishing: During May 1958, the Portuguese fishing fleet landed 9,913 metric tons of sardines (valued at US\$735,521 ex-vessel or \$74.20 a ton). In May 1957, a total of 7,923 tons of sardines were landed (valued at US\$933,391 or \$117.81 a ton).

Canneries purchased 34.1 percent or 3,389 tons of the sardines (valued at US\$270,716 ex-vessel or \$79.88 a ton) during May. Only 39 tons were salted, and the balance of 6,485 tons, or 65 percent of the total was purchased for the fresh fish market.

Matosinhos lead all other ports in May landings of sardines with 5,203 tons or 52.4 percent, followed by Setubal 1,606 tons (16.2 percent), and Peniche 1,168 tons (11.7 percent).

Other Fishing: The May 1958 landings of fish other than sardines consisted of 2,039 tons (value US\$220,976) of chinchard, and 112 tons (value US\$10,331) of anchovies. (*Conservas de Peixe*, July 1958.)



Spain

VIGO FISHERIES TRENDS, JUNE 1958:

Fish Exchange: Landings at the Vigo, Spain, Fish Exchange amounted to 9.7 million pounds during June 1958, an increase of about 0.8 million pounds over the preceding month, but about 1.2 million pounds below the landings for June 1957. The June 1958 landings were valued at US\$1,138,000, an increase of about 8 percent in value over June 1957. The increased value was due to the increase in fresh fish prices (over 25 percent for the more expensive species).

Leading species sold over the Fish Exchange were large and small hake (2.1 million pounds), horse mackerel (1.4 million pounds), and sardines (1.2 million pounds). Sardine landings increased 385 metric tons over the June 1957 figure of 138 tons. Landings of albacore tuna declined 149 tons in June this year from the 318 tons landed in June last year.

Fish Canning And Processing: Fish canning in June increased seasonally, but continued to operate at about 25

Spain (Contd.):

percent of capacity. During June 1958 cannery bought over the Exchange 536 metric tons of fresh fish, only 98 more tons than in May, but 106 tons less than in June 1957. The decline in the purchases was attributed to the lower catches this June as compared with June 1957.

Fishing Vessel Loans: The Treasury Committee of the Spanish Cortes has approved a proposed extension of the "Law for the Protection and Modernization of the Merchant Fleet" which was first passed on October 26, 1956. The fishing fleet can now receive credits from the Instituto Social de la Marina of about US\$2.1 million for the construction and modernization of fishing vessels. Further credits may be extended as a result of studies under way for the protection of the fishing fleet. These studies indicate that US\$7.7 million is needed annually for the next 10 years for construction and renovation.



Surinam

SHRIMP FISHERY TRENDS, JUNE 1958:

Operation of Surinam's shrimp trawler *Coquette* continued to be limited during June because the vessel was operating alone and net repair facilities were not available. The vessel made four trips--was out 14 days in all (7 actual working days), and made only 26 drags. Total catches amounted to 1,780 pounds of large shrimp and 180 pounds of fish.

A Surinam shrimp-packing plant expected to ship 16,000-17,000 pounds of frozen shrimp to the United States--1,000 pounds of large shrimp, and the remainder sea bob.

Improvements on the ice plant at the Paramaribo shrimp-processing plant were moving ahead rapidly, according to a July 15, 1958, dispatch from the United States Consul at Paramaribo. The new flake-ice equipment had been installed and was expected to be ready to operate by the middle of August. Work on the pier (164 feet in length) was in process; and most of the piling had been driven in. Trimming of the piles, placement of stringers, and plank-ing were also expected to be finished by the middle of August.



Uganda

**FISHERY DEVELOPMENTS
REPORTED BY FAO EXPERT:**

A fisheries expert of the Food and Agriculture Organization of the United Nations commented recently on the effects of mechanization of fishing craft on the lakes of Uganda, which has resulted in doubling the fish catch in six years. He stated that the Uganda fish catch in 1957 was about 48,500 metric tons, double the catch of 1951. This increase, he explained is the result of the introduction of nylon nets and outboard motors, which was started late in 1953. He further stated that presently there are more than 1,200 outboards installed in the fishing craft of the Uganda lakes, a development which has taken place largely as a result of the work of the Uganda Game and Fisheries Department, with no direct financial aid from the Government.

The fisheries expert has surveyed the fish marketing situation in Uganda. To accomplish this, he stated that he set up 19 points for area surveys to gather information in key markets as to where the fish came from, how they were transported and handled, what prices they fetched, and what species were preferred by local buyers. The information obtained, he continued, made it possible to see what should be done to encourage development of fish marketing. He said that he found a flourishing fishery which will continue to expand rapidly once a few bottlenecks are cleared away.

He declared that as a start, he has worked with the Government in organizing eight pilot projects, financed by the African Trade Development Fund. These projects, he said, include setting up primary fish markets, retail-wholesale markets with storage facilities and, in three remote places, fish storage facilities, with a shop attached to each to supply fishermen with equipment and material. If these pilot projects are successful, he stated, they will be developed on a larger scale.

The fisheries expert has also proposed to the Government that "feeder roads" should be built to give access to remote parts of the lakes to open them

Uganda (Contd.):

for fishing. As an example, he pointed out that the southern end of Lake Albert is rich in fish. Fishermen on the Belgian Congo side of the lake take 6,000 tons of fish a year from it and have built up a prosperous industry which includes modern processing plants. He said that he believes the Uganda fishermen could catch and market a similar amount of fish once they have access to that part of the lake. The Government has allocated US\$28,175 to build a road for this purpose, he continued, and plans are already being made by a private firm to build a processing plant at the lakeside as soon as the road is built.

At present, he explained, more than 20 percent of the Uganda fish catch is sold in the Belgian Congo, providing a good trade that brings in a hard currency, the Belgian franc. He added that there is no reason why this trade should not continue or be expanded. He stated that, on the other hand, the lucrative domestic market in central Uganda had been neglected and this is the market which could absorb all the increased catch, especially as the population and the incomes are steadily increasing. He added that there are now about 5,750,000 people in Uganda, all Africans except for some 9,000 Europeans and 56,000 Asians.

In conclusion, he stated that the most interesting thing about the Uganda fisherman is that he is his own master, not indebted to merchants or middlemen as is so commonly the lot of fishermen in Africa and Asia, and while generally conservative, very shrewd, and progressive.



Union of South Africa

PILCHARD-MAASBANKER INDUSTRY, JANUARY-APRIL 1958:

Operating in three main areas in a period of intensive fishing from early April to the middle of May, the boats of the Union of South Africa Cape west coast caught more than 100,000 metric tons of pilchards, maasbanker (jack mackerel),

and mackerel--nearly half the catch of an average season and the best period of almost continuous fishing in the 15-year history of the industry.

Although bad weather interrupted fishing in the second half of May, the catch for the month of April had already set a new record for the Cape West Coast. The previous best month was in January 1954 when 50,814 tons of pilchards and maasbanker were landed; another good month was in March 1955 (50,229 tons); and in May last year the remarkable maasbanker rush enabled fishermen to land 50,440 tons.

These high figures have now been left far behind by the 68,645 tons (54,736 tons pilchards and 13,909 tons maasbanker) landed in April this year; also 2,032 tons of mackerel. The catch was processed by 13 large factories, two small canneries, and a fish drying company. The amount of fish processed during the month ranged from more than 10,000 tons at one factory on the St. Helena Bay coast to just over 50 tons at one inland cannery. The average for the larger factories was 5,000 to 6,000 tons. Total production figures show an output in April 1958 of 12,319 tons of fishmeal, 1,000,860 gallons of fish body oil, and 6,105,752 pounds of canned fish (2,190,399 pounds canned pilchards, 3,336,926 pounds maasbanker, and 578,427 pounds mackerel).

The April catch of 70,677 tons brought the total for the first four months of 1958 to 146,573 tons--110,840 tons of pilchards, 15,445 tons of maasbanker, and 20,288 tons of mackerel.

In April 1957 a total of 16,895 tons of pilchards, 2,843 tons of maasbanker, and 6,876 tons of mackerel were landed. Landings in April 1956 amounted to 20,379 tons of pilchards and 3,574 tons of maasbanker.

In the past four years the fishery has become used to wide fluctuations over a single season. Several months of bad fishing have been followed by a sudden rush, huge catches for some weeks, and then another quiet period. Factory operators and fishermen are, therefore, cautious in their estimate for the remaining half of the current season.

Union of South Africa (Contd.):

From the start, the 1957 season seemed more promising than the 1956 bad year, but fishing was relatively quiet. Then came the maasbanker rush. Echo-sounders picked up huge shoals just below the surface and in the second half of May and the first half of June, the biggest maasbanker catches in the history of the industry were made. It was expected that the 250,000-ton pilchard-maasbanker quota would be reached within a few months of the May-June rush, but catches were poor for the rest of the year and 1957 ended with only 211,742 tons of the quota.

This year, however, good months have come early. In January, West Coast boats were fishing in the False Bay area, a journey of 12 to 15 hours from the factories. In February pilchards appeared in large shoals in the Dassen Island area and even near Cape Town. Catches in February and March were reasonably good and by the end of the first quarter the quota total was 57,640 tons--56,104 tons of pilchards and 1,536 tons of maasbanker.

Then in April vast densely-packed shoals of pilchards appeared off the coast between Saldanha Bay and Cape Town. Shoals have been so thick that it has been difficult to move through them. An echo-recording by one boat showed a shoal at least 16 miles long and estimated by the boat's skipper to be about 2 miles wide. Even with its 60- to 65-foot boats and its larger, deeper nets, the industry has only scratched at this mass of fish.

Both nets and boats have put up some outstanding performances. One boat from Saldanha caught 220 tons of fish in a single set and three boats loaded from the net.

Later in April, boats moving south from St. Helena Bay to catch pilchards, found big shoals of maasbanker near their factories in the area off Klein Tafelberg. As in the rush of 1957, these shoals were just below the surface and had to be found by echo-sounders. The fish were again remarkably large for the species and were extremely firm and ideal for canning.

Thus the West Coast industry has been able to fish for both pilchards and maasbanker and has spread its operations over nearly 100 miles of coastal waters. By the end of May, boats were again out making good catches and landings for the month. Although below those of April, the catch may well amount to more than 40,000 tons. (The South African Shipping News and Fishing Industry Review, June 1958.)

* * * * *

WHALING PRODUCTION:

The 1957 Antarctic offshore whaling season catch totaled 2,500 whales, a substantial increase over the catches made during previous seasons.

Union of South Africa Production of Whale and Sperm Oils and Whale Meat, 1953-57				
Season	Whale Oil	Sperm Oil	Whale Meat	Total
		(1,000 Lbs.)		
1957 ¹	15,543	8,400	12,412	36,355
1956	13,530	5,625	9,258	28,413
1955	19,739	6,164	5,932	31,835
1954	10,539	5,569	5,436	21,544
1953	10,080	4,637	8,176	22,893

¹/Production for the Donkergat Station not included.

With the sale of the factoryship Abraham Larsen to Japanese interests, South Africa has now withdrawn from Antarctic whaling.



U. S. S. R.

ICELAND'S TERRITORIAL WATERS FISHING LIMITS EXTENSION SUPPORTED:

The Iceland Foreign Ministry announced on June 6, 1958, that the Soviet Ambassador had brought a message from his Government saying that it had no objection to the proposed extension of Iceland's fishing limits from 4 to 12 miles off Iceland's coasts, and that every Government was free to fix such limits in the waters off its coasts up to 12 miles, according to the London Times of June 6.



United Kingdom

CANNED SALMON IMPORTS FROM CANADA:

In reply to a question raised in the British House of Commons on July 8, 1958, the President of the Board of Trade stated that Great Britain had imported 8,736,000 pounds of canned salmon from Canada for the 12 months ending May 31, 1958. In his reply to the question he also stated that during comparable periods of 1937 and 1938, 18,816,000 pounds (valued at US\$1,960,000) and 19,040,000 pounds (valued at US\$2,240,000), respectively, had been imported (United States Embassy in London dispatch, July 14, 1958).

* * * * *

GOVERNMENT'S VIEWS ON FAROESE FISHING LIMITS:

The British Government recently made a reply to the Danish Government's official backing of the Faroe Islands' wish to extend their fishery limits to 12 miles from September 1, 1958.

Britain would be prepared to join in negotiations with the Danes, the reply stated, but regarded formal negotiations as premature as long as the fishery dispute with Iceland remained unresolved.

Meanwhile the Danish Prime Minister had, in a broadcast from Thorshavn in the Faroes, again affirmed his Government's backing for the Faroes, and said that he would have further discussions with Britain.

The British note pointed out that a unilateral declaration has no legal effect, and that if Britain agreed to cancel the fisheries conventions of 1901 and 1955, which stipulated a 3-mile limit, this would not bind other nations.

The note also asked for the Danish Government's views on the desirability of holding a conference of nations using the Faroeese grounds. Such a conference, it stated, would only be able to reach agreement on the lines of the proposals most supported at the Conference on the Law of the Sea held recently in Geneva.

Such decisions would give the Faroes less territorial waters than they now claim, and it would be essential to know whether the Faroes would accept the result. The British Government was anxious that any agreement reached should provide some degree of stability.

The note added that, as far as Britain was concerned, the present 4-mile limit around Iceland remained unchanged by Iceland's unilateral declaration extending its limits to 12 miles.

It was reported from Bonn that the Icelandic decision was felt to have created a new and serious situation, and might mean laying up part of the West German fishing fleet. It was hoped there that there would be a conference of all states bordering the Atlantic to find a successful solution to the problem.

Canada, too, expressed hope that another conference on the Law of the Sea might be arranged. The Canadian External Affairs Minister told the House of Commons in Ottawa that Canada will not extend her own offshore fishing limits at this time, and he said that Canada would regard Iceland's decision as provisional until September 1. He expressed the hope that Britain and Iceland would be able to undertake bilateral talks before that time. (*The Fishing News*, July 11, 1958.)

* * * * *

ICELAND'S 12-MILE FISHING LIMIT OPPOSED:

Trawler captains in the United Kingdom in mid-August were briefed on sailing within Iceland's new 12-mile sea boundaries for fishing. This was a precaution against incidents with Icelanders, who intend to enforce the extension of their territorial waters from 4 to 12 miles effective September 1, 1958.

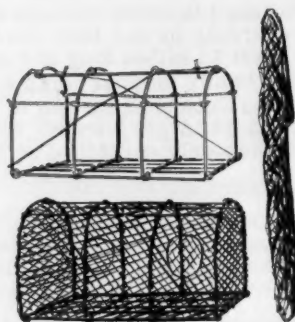
Other North Atlantic Treaty Organization powers--West Germany, Holland and France--have arranged to join the United Kingdom in opposing the action of Iceland, also a NATO member.

The British preparatory moves were disclosed by officials of the Government and the British Trawler Federation, as backstage NATO efforts for a compromise appeared to be slowing down.

* * * * *

LOBSTER POT DEVELOPED WITH FOLDING STEEL FRAME:

A folding lobster pot with an all-steel frame, that reportedly can be erected in seconds, is being produced by a Yorkshire firm in the United Kingdom. The folding pot, when collapsed, is said to



Folding lobster trap with metal frame.

require one-fifth of the storage space of a rigid pot, thus facilitating handling to and from shore and stacking on decks of fishing vessels.

The folding pots, which are of the Scottish creel type, are made with steel frames of $\frac{5}{16}$ -inch and $\frac{1}{4}$ -inch thickness.

United Kingdom (Contd.):

The frames are galvanized and protected against corrosion with bitumen paint. The base of the steel frame is 18 by 24 inches, the height is 14 inches, and the length when folded is 38 inches. The frame weighs approximately $9\frac{1}{2}$ pounds. With netting added, the frame weighs about 11 pounds. Frames can also be manufactured in special sizes and shapes.

The all-steel framework is designed to make ballast unnecessary and reduce resistance to the forces of tide and undertow. Also, the strength of the steel frame is said to withstand storm damage, making it unnecessary to remove the lobster pots during gales.

The pot frames are equipped with manila-rope netting but can also be supplied with nylon netting. The netting is made in two pieces to facilitate removal for painting the frame or performing other types of maintenance.

Tests made with the new lobster pots indicate that they fish well and that the merits of folding and endurance suggest that they may well prove successful for better fishing and long-term economy. (*The Fishing News*, April 18, 1958, and *World Fishing*, August 1958.)

NEW FISH-SMOKING MACHINE DEVELOPED:

A new fish-smoking machine, called a "fluidiser," was expected to be completely assembled by the end of September 1958. The machine, which employs the technique of fluidization, has been designed to ensure greater consistency in the production of tasty, eye-appealing, and well-cured fish. Experiments using both fish and bacon in the new device have proved very successful.

This invention comes as a climax to several years of research at the Humber Fisheries Laboratory of the United Kingdom's Department of Scientific and Industrial Research. The fluidization technique, which is used in other industries such as oil refining, has been applied to fish smoking for the first time in this new machine. The device is about 7-8 feet in height and resembles a rocket in shape. Inside the apparatus, a current

of air generates a sandstorm of toasted sawdust, producing smoke which is then regulated. (*The Fishing News*, August 8, 1958.)

SUBSIDIES FOR WHITEFISH AND HERRING INDUSTRIES:

Details of the amounts of subsidy paid to the whitefish and herring industries of the United Kingdom were given recently by the Minister of Agriculture, Fisheries and Food. The Minister stated that the total amount authorized by the White Fish and Herring Industries Acts, 1953 and 1957, for subsidies was £17,000,000 (about US\$47.7 million) which might be increased by Order to £19,000,000 (US\$53.3 million).

The total amount paid under these Acts to June 30, 1958, was £12,523,690 (US\$35.1 million). The amount still available from July 1, 1958, was therefore £4,476,310 (US\$12.6 million) or £6,476,310 (US\$18.2 million) if the full amount of £19,000,000 was made available.

Under the Acts of 1953 and 1957 the whitefish subsidy had been payable since August 1, 1953, and the herring subsidy since May 13, 1957. (*Fish Trade Gazette*, August 2, 1958.)



Venezuela

CANNED SARDINE EXPORTS TO MEXICO UNDER CONSIDERATION:

The Venezuelan fishing industry is considering the sale of large quantities of canned sardines to Mexico, but the matter is still in the initial stage of discussion, according to the President of the *Asociacion de Industriales de la Pesca*.

The sale would necessitate Venezuelan clearance for Mexican cartons and cans which would be labeled in Mexico, imported into Venezuela, packed with local sardines, and then shipped back to Mexico where the Venezuelan sardines would be granted entry. The Venezuelan Government has not been approached regarding the clearance, states a June 19 dispatch from the United States Embassy in Caracas.



FEDERAL ACTIONS



Federal Trade Commission

CONSENT ORDER APPROVED PROHIBITING ILLEGAL BROKERAGE BY SEA FOOD PACKER AND ITS SUBSIDIARY:

The Federal Trade Commission on July 1, 1958, approved a consent order (6942, canned seafood) prohibiting a Bellingham, Wash., salmon packer and its sales subsidiary from making illegal brokerage payments to their customers.

The Commission adopted an initial decision by Hearing Examiner Abner E. Lipscomb containing an order agreed to by the companies and the Commission's Bureau of Litigation.

The concerns were charged in a Commission complaint, issued Nov. 18, 1957, with giving favored customers discounts or allowances in lieu of brokerage on purchases for their own account for resale, which practice is prohibited by Sec. 2(c) of the Robinson-Patman Amendment to the Clayton Act.

According to the complaint, the firm's pack of salmon and other seafood products generally is sold by the subsidiary through other brokers. However, many direct sales are made to chains and large buying groups without utilizing brokers, and these favored customers are charged less than buyers who purchase through brokers, the complaint stated. These reduced prices, it added, reflect the $2\frac{1}{2}$ -percent brokerage fee ordinarily paid.

The order forbids this practice in the future.

The agreement is for settlement purposes only and does not constitute an admission by the companies that they have violated the law.



Department of the Interior

AGREEMENT WITH ALABAMA ON PROTECTION OF AQUATIC LIFE DURING GULF OF MEXICO EXPLORATORY OIL OPERATIONS:

A cooperative agreement has been entered into between the Alabama Department of Conservation and the U. S. Department of the Interior covering the protection and conservation of aquatic life on the Gulf of Mexico outer Continental Shelf seaward of the submerged lands of Alabama during geological and geophysical explorations. The notice as it appeared in the August 30, 1958, Federal Register follows:

DEPARTMENT OF THE INTERIOR

Office of the Secretary

OUTER CONTINENTAL SHELF

GEOLOGICAL AND GEOPHYSICAL EXPLORATION

Pursuant to the notice issued by the Secretary of the Interior on September 17, 1953, concerning geological and geophysical explorations in the outer Continental Shelf (18 F. R. 5667), a cooperative agreement has been entered into with the Alabama Department of Conservation covering the protection and conservation of aquatic life. In accordance with the provisions of the said notice as supplemented by the cooperative agreement, any person, as defined in section 2 (d) of the Outer Continental Shelf Lands Act of August 7, 1953 (67 Stat. 462), is hereby authorized to conduct geological and geophysical explorations in that part of the outer Continental Shelf seaward of the submerged lands of the State of Alabama upon condition (1) that his operations shall be confined to such area or areas as may be designated and approved by the Regional Oil and Gas Supervisor of the United States Geological Survey, (2) that he has obtained appropriate permission for such explorations from the Corps of Engineers, Department of the Army, and (3) that, for the protection and conservation of aquatic life he files with the said Regional Oil and Gas Supervisor and with the Alabama Department of Conservation his stipulation agreeing to comply with the requirements of the regulations of the said Department governing the methods and inspection of and restrictions upon geological and geophysical explorations in the submerged lands of the State of Alabama, which regulations are hereby adopted as the regulations of the

Secretary of the Interior' applicable to that part of the outer Continental Shelf seaward of the submerged lands of the State of Alabama.

The enforcement of the regulations hereby adopted is delegated to the Regional Oil and Gas Supervisor of the United States Geological Survey, and he may accept the assistance of the State of Alabama, in the enforcement of the said regulations. This general authorization to conduct geological and geophysical explorations is subject to termination upon not less than 60 days' notice published in the Federal Register, and the authorization to conduct such explorations may be terminated as to any person upon reasonable notice.

Dated: August 25, 1958.

HATFIELD CHILSON,
Acting Secretary of the Interior.



Department of State

RENEGOTIATIONS UNDER THE GATT WITH SEVERAL COUNTRIES:

On July 8, 1958, the U. S. Department of State released the results of renegotiations under the General Agreement on Tariffs and Trades (GATT) held by Australia, New Zealand, Austria, Finland, and the Netherlands (for Surinam) with the United States for the modification or withdrawal of certain tariff concessions previously made by these countries under GATT. The United States agreed to modification or withdrawal of certain concessions in return for new concessions on trade items in which it has an interest. In some cases, the United States was able, during the course of the negotiations, to persuade countries to withdraw certain proposed modifications. No changes in United States duties were involved in these renegotiations.

No fisheries products were involved except in the case of the Netherlands for Surinam negotiations with the United States. In this instance the duties on certain prepared or preserved fish were scheduled to be increased from 20 percent to 40 percent. In the course of the negotiations, Surinam and the Netherlands were persuaded not to raise the rates on these fish products. While the concession on fish had not been initially negotiated with the United States, the United States is in the position of first supplier to Surinam.

Specifically, the tariff item number, description of the product, existing and proposed rates, and trade figures (1954-56 average) for Surinam imports from the United States are shown in the table.

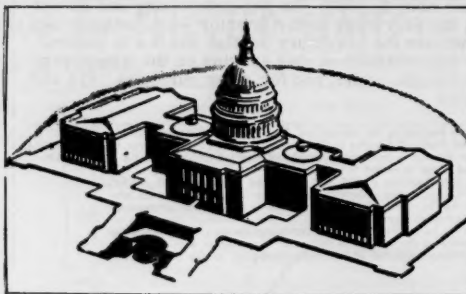
Tariff Item Number	Description	Old GATT Rate	New GATT Rate	Surinam Imports From U. S. (1954-56 Average)
		%	%	US\$
Part B. Modifications proposed but withdrawn during negotiations				
		Proposed Rebinding		
16.03 (a)	Prepared or preserved fish, sardines, and other fish in tomato sauce, in tins	20	40	48,600 (est.)



Eighty-Fifth Congress

(Second Session)

Public bills and resolutions which may directly or indirectly affect the fisheries and allied industries are reported upon.



Introduction, referral to committees, pertinent legislative actions, hearings, and other chamber actions by the House and Senate, as well as signature into law or other final disposition are covered.

Additional actions taken prior to adjournment on August 24, 1958, and not previously reported here were the following:

CHEMICAL PRESERVATIVES DEFINITION:

H. R. 9521, a bill to amend paragraph (k) of section 403 of the Federal Food, Drug, and Cosmetic Act, as amended, to define the term "chemical preservative" as used in such paragraph. H. R. 9521 was reported (H. Rept. No. 2119) by the House Committee on Interstate and Foreign Commerce on July 7, 1958. The House Committee on Rules reported H. Res. 651 (H. Rept. 2302) on July 29, 1958. The resolution, which had been previously rejected, provided for consideration of the bill under a limited debate rule. The bill was passed by the House on August 20, 1958, but no further action was taken by this session of Congress. A similar bill (S. 2880) introduced in the Senate on August 29, 1957, failed to clear the Senate Committee on Labor and Welfare.

DOGFISH SHARK BOUNTY: H. R. 13554 (Mack of Wash.) introduced in the House on July 28, 1958; H. R. 13612 (Wilson) and H. R. 13613 (Tollefson) introduced on July 30, 1958; and H. R. 13656 (Norblad) introduced on August 4, 1958; identical bills to provide for the payment of bounties on dogfish sharks to control the depredations of this species on fishes of the Pacific Coast referred to the Committee on Merchant Marine and Fisheries. These bills are similar to two other House bills, and S. 2719, as amended, which was enacted into law (Public Law 85-887, signed on September 2, 1958).

H. J. Res. 685 (Tollefson), introduced in the House on August 7, 1958, a joint resolution author-

izing and directing the Secretary of the Interior to investigate and eradicate the predatory dogfish sharks and to provide for the payment of bounties on dogfish to control the depredations of this species in the fisheries of the Pacific Coast, and for other purposes; to the Committee on Merchant Marine and Fisheries.

Public Law 85-887, 85th Congress, S. 2719, September 2, 1958: An Act authorizing and directing the Secretary of the Interior to investigate and eradicate the predatory dogfish sharks to control the depredations of this species on the fisheries of the Pacific coast, and for other purposes. (72 stat. 1710.)

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of the Interior is hereby authorized and directed to prosecute, for a period of not to exceed four years from the date of approval of this Act, investigations of the abundance and distribution of dogfish sharks, experiments to develop control measures, and a vigorous program for the elimination and eradication or development of economic uses of dogfish shark populations.

Sec. 2. In carrying out the foregoing purposes and objectives the Secretary of the Interior is authorized to cooperate with the official conservation agencies of the States bordering on the Pacific coast,

with the commercial fishing industry, and with other governmental or private agencies, organizations, or individuals having jurisdiction over or an interest in the fisheries of the Pacific coast.

Sec. 3. There is authorized to be appropriated from time to time, Appropriation, out of any moneys in the Treasury not otherwise appropriated, such sums as may be necessary, not to exceed \$50,000 per annum to carry out the purposes and objectives of this Act.

Approved September 2, 1958.

(See Commercial Fisheries Review, September 1958, p. 108, for legislative history of S. 2719 and related House bills.)

FISH AND WILDLIFE SERVICE SUPPLEMENTAL APPROPRIATIONS: H. R. 13450, a bill making supplemental appropriations for the fiscal year ending June 30, 1959, and for other purposes. Bill was signed by the President on August 27, 1958 (P. L. 85-766). As passed it contains funds to finance for six months the inspection and certification services for fish, shellfish, and related products (\$85,000); funds for the administration of the Alaska game law and Alaska fisheries; and funds for the Outdoor Recreation Resources Review Commission (\$50,000).



TRY SCALLOPS--"THOSE LITTLE MORSELS OF GOODNESS"

Plentiful supplies of scallops are now available and prices are extremely reasonable. Because they are marketed in the form of dressed meat, most people are unaware that they are a shellfish, with two shells, somewhat similar to the clam. Its shells are rounded with a wavy, scalloped edge. A large muscle opens and closes these shells. This muscle is the only part of the scallop which is eaten in America, although Europeans eat the entire scallop.

There are two varieties of scallops, the small bay from inshore bay waters and the large sea found on offshore banks of the North Atlantic. Both have lean, white, firm meat and a sweet flavor. They are surprisingly low in calories, high in protein, and delectable when baked, broiled, or fried. Scallops are particularly good when prepared in combination with other foods--such as creamed or in casseroles.

The home economists of the Fish and Wildlife Service suggest a combination dish "Devised Scallops" as a treat for the entire family.

DEVEILED SCALLOPS

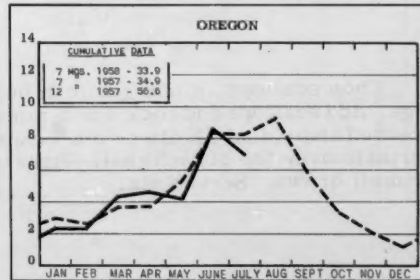
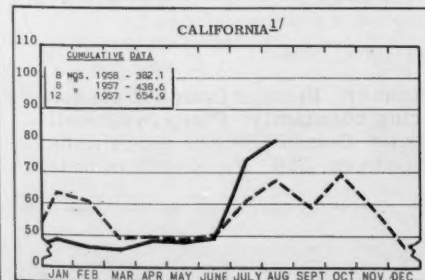
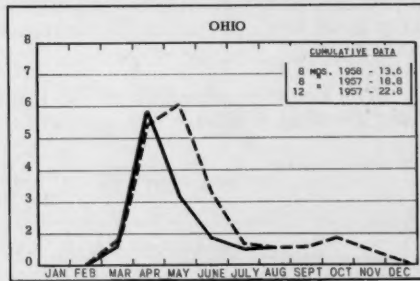
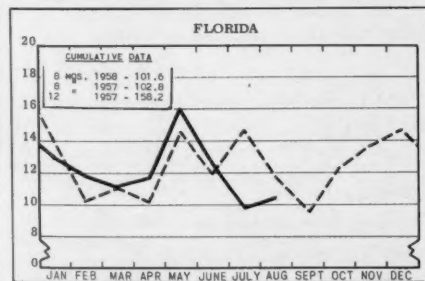
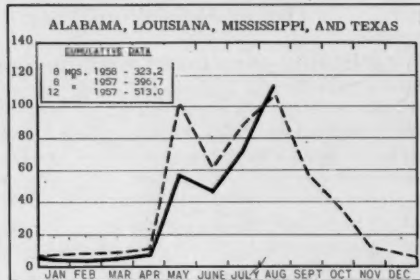
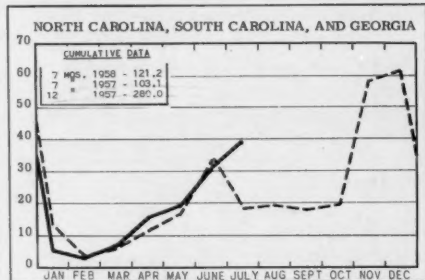
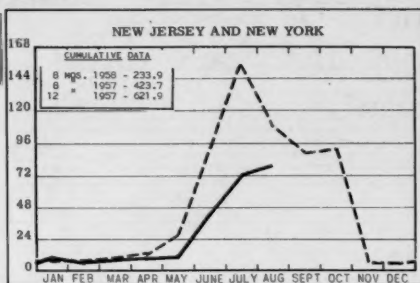
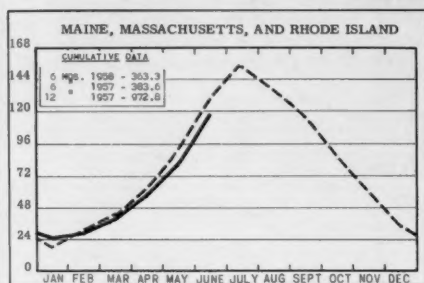
1 POUND SCALLOPS	$\frac{1}{2}$ TEASPOON CELERY SALT
1 CLOVE GARLIC, CHOPPED	2 TABLESPOONS CHOPPED PARSLEY
2 TABLESPOONS BUTTER, MELTED	1 TABLESPOON LEMON JUICE
2 TABLESPOONS FLOUR	DASH PEPPER
$\frac{1}{2}$ TEASPOON DRY MUSTARD	2 TABLESPOONS BUTTER, MELTED
2 TABLESPOONS HORSE RADISH	$\frac{1}{2}$ CUP SOFT BREAD CRUMBS

Chop scallops. Cook garlic in butter until tender. Blend in flour and seasonings. Add scallops and cook 4 to 5 minutes, stirring constantly. Place in six well-greased individual shells or six-ounce custard cups. Combine butter and crumbs; sprinkle over top of each shell. Bake in a moderate oven, 350° F., 15 to 20 minutes or until brown. Serves six.

FISHERY INDICATORS

CHART 1 - FISHERY LANDINGS for SELECTED STATES

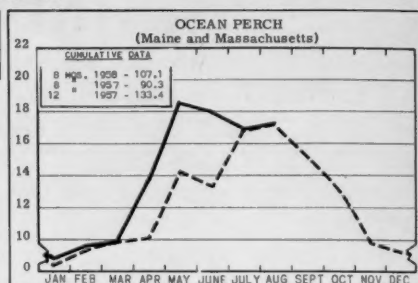
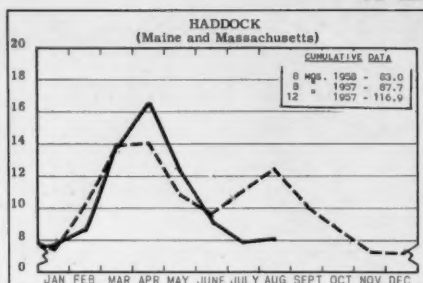
In Millions of Pounds



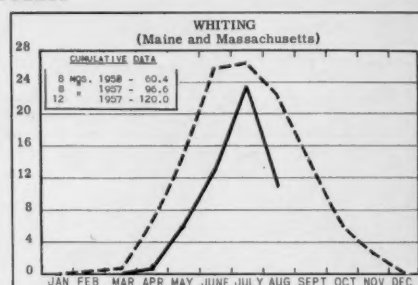
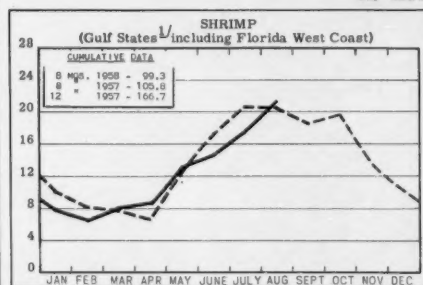
^{1/}ONLY PARTIAL--INCLUDING PRODUCTION OF MAJOR FISHERIES AND MARKET FISH LANDINGS AT PRINCIPAL PORTS.

CHART 2 - LANDINGS for SELECTED FISHERIES

In Millions of Pounds

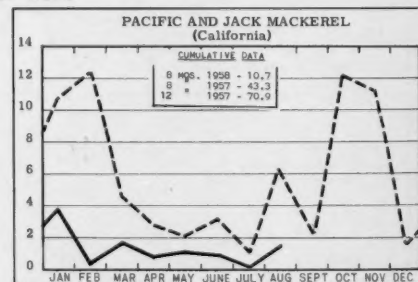
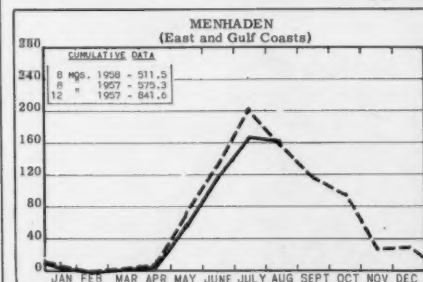


In Millions of Pounds



^{1/}LA. & ALA. DATA BASED ON LANDINGS AT PRINCIPAL PORTS AND ARE NOT COMPLETE.

In Thousands of Tons



In Thousands of Tons

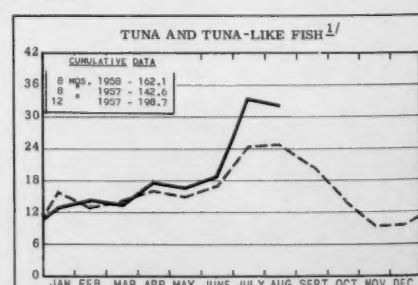
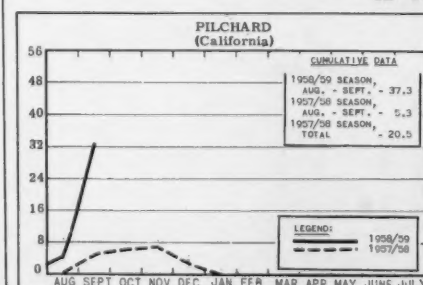
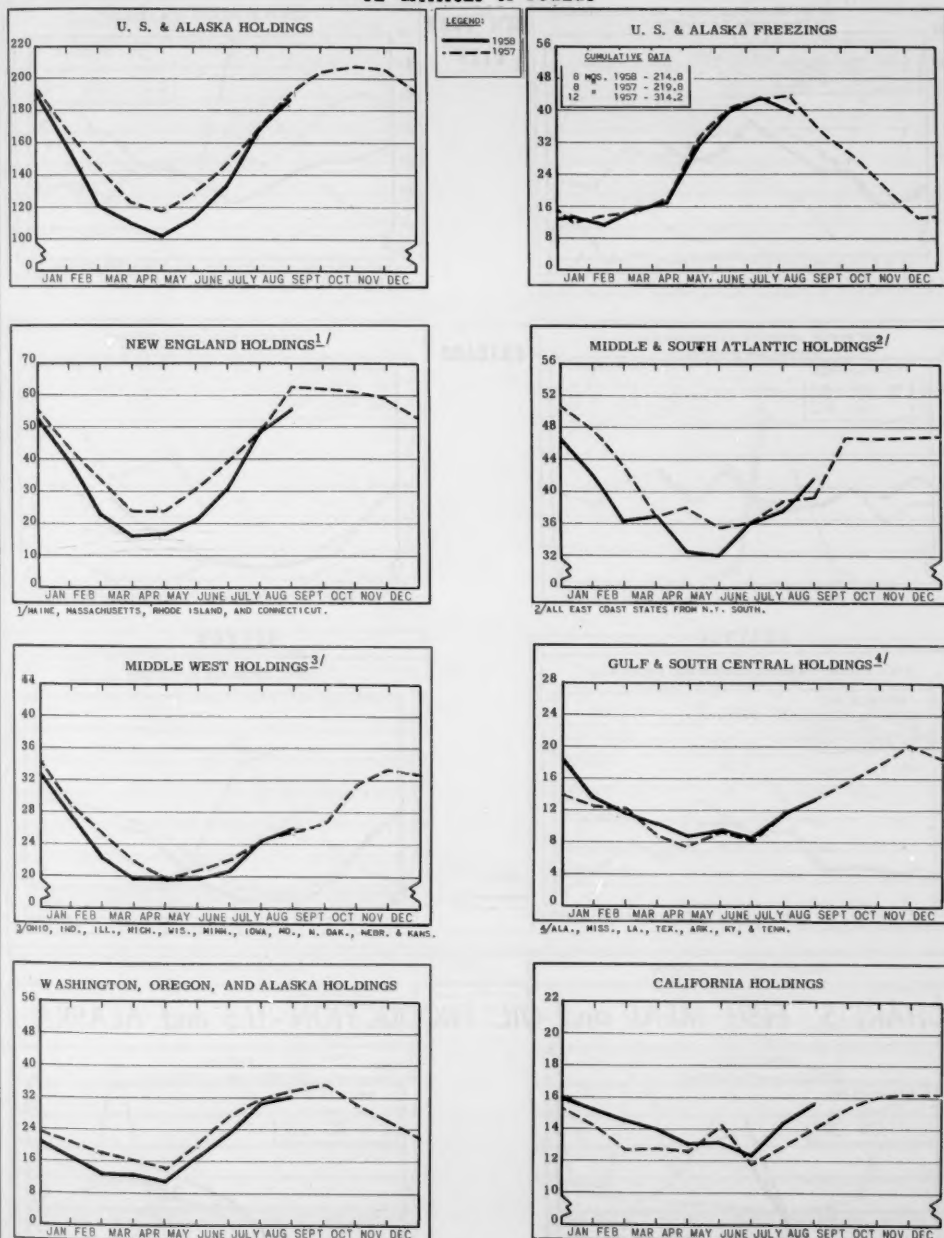


CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS *

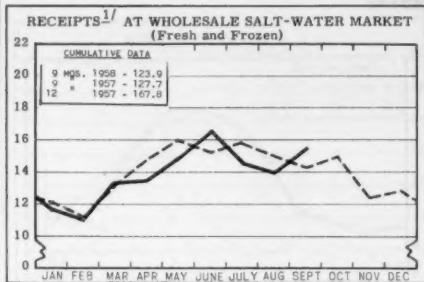
In Millions of Pounds



* Excludes salted, cured, and smoked products.

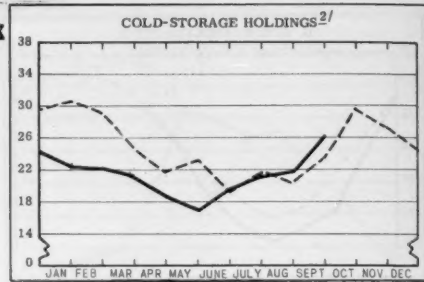
CHART 4 - RECEIPTS and COLD-STORAGE HOLDINGS of FISHERY PRODUCTS at PRINCIPAL DISTRIBUTION CENTERS

In Millions of Pounds

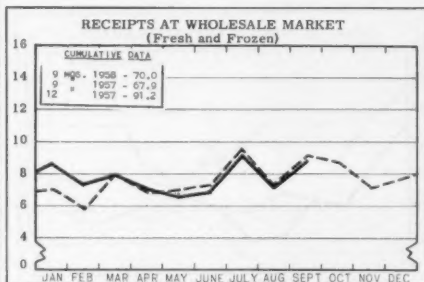


^{1/}INCLUDE TRUCK AND RAIL IMPORTS FROM CANADA AND DIRECT VESSEL LANDINGS AT NEW YORK CITY.

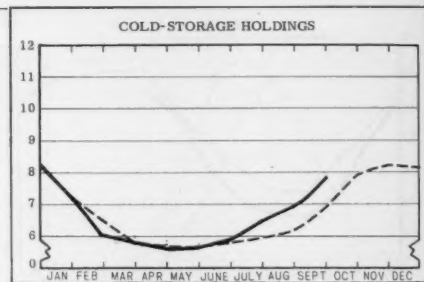
NEW YORK CITY



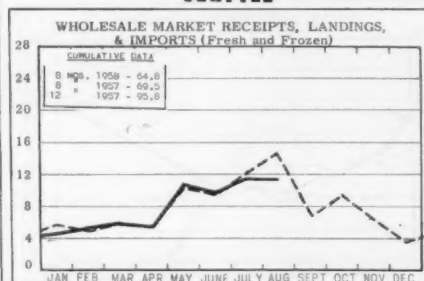
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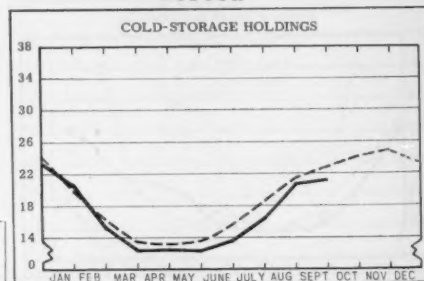
CHICAGO



SEATTLE



BOSTON



LEGEND:
— 1958
--- 1957

CHART 5 - FISH MEAL and OIL PRODUCTION - U.S. and ALASKA

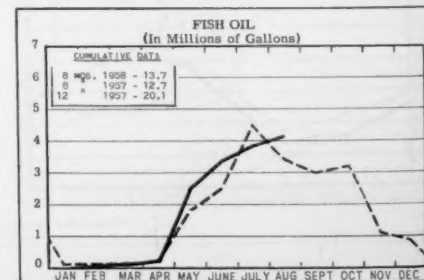
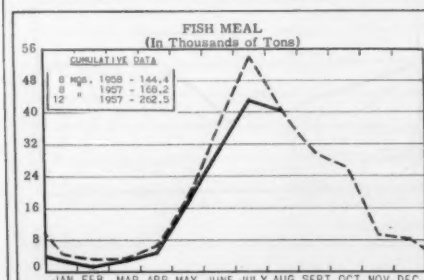
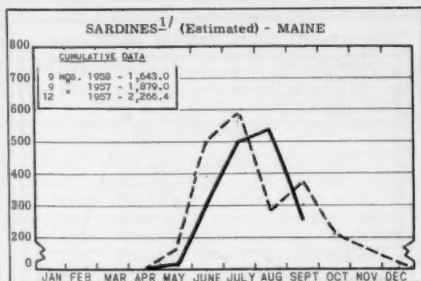
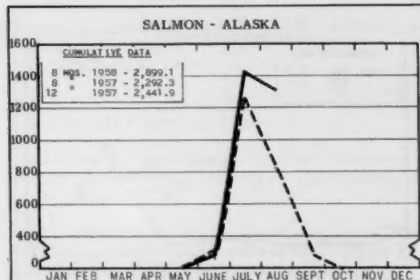
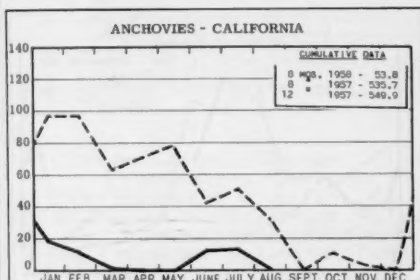
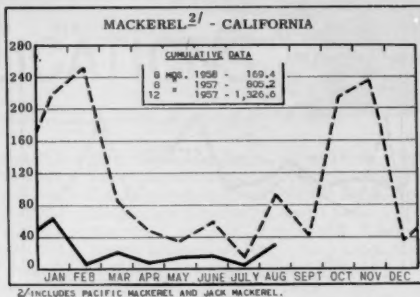
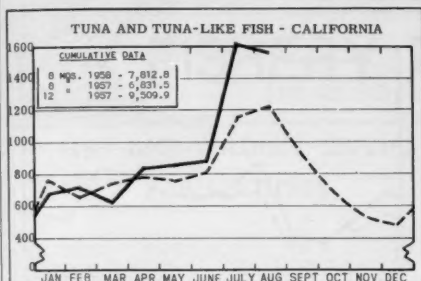


CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

In Thousands of Standard Cases



STANDARD CASES

Variety	No. Cans	Designation	Net Wgt.
SARDINES.....	100	$\frac{1}{2}$ drawn	3 $\frac{1}{2}$ oz.
SHRIMP.....	48	--	5 oz.
TUNA.....	48	# $\frac{1}{2}$ tuna	6 & 7 oz.
PILCHARDS...	48	# 1 oval	15 oz.
SALMON.....	48	1-lb. tall	16 oz.
ANCHOVIES...	48	$\frac{1}{2}$ -lb.	8 oz.

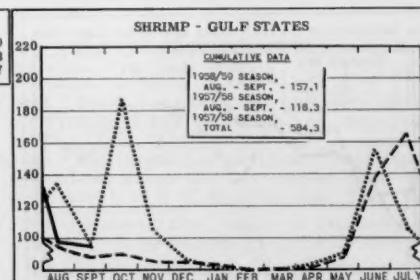
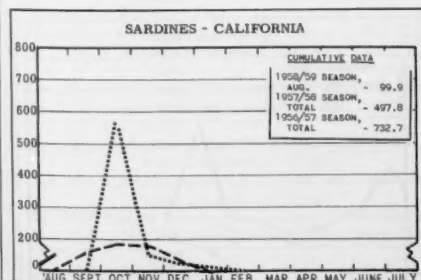
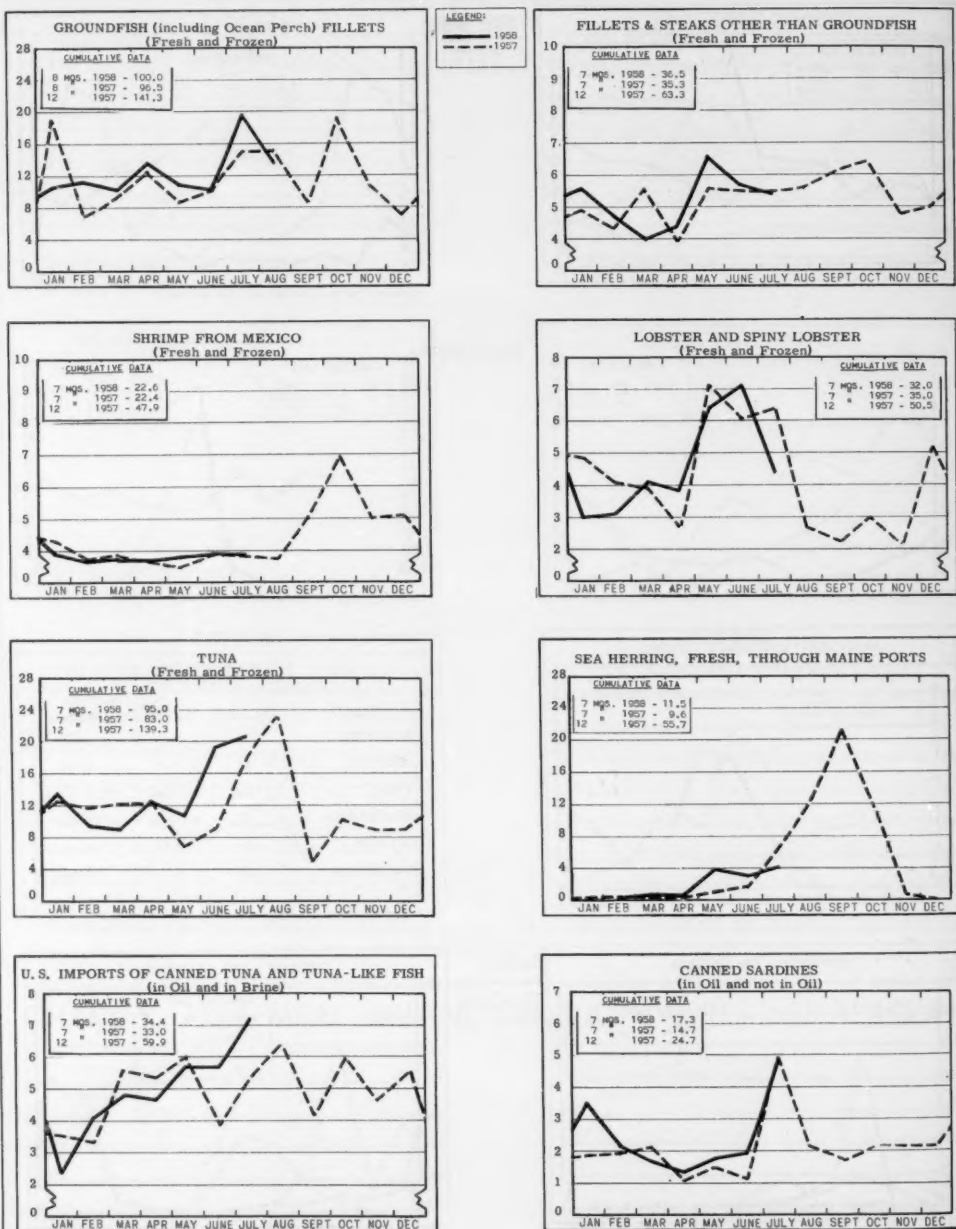
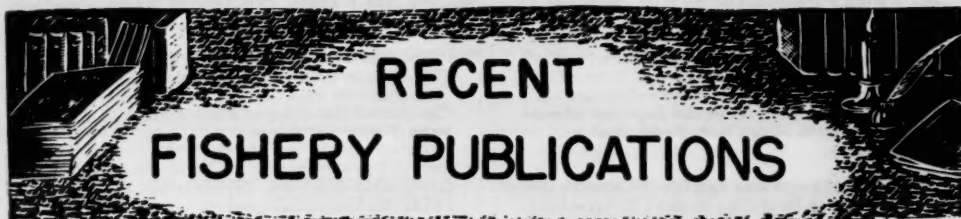


CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

In Millions of Pounds





RECENT FISHERY PUBLICATIONS

FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE DIVISION OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

- CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES AND ALASKA.
SL - STATISTICAL SECTION LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.
FL - FISHERY LEAFLETS.
SSR - FISH. - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).
SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.

Number	Title
CFS-1773	- Massachusetts Landings, 1957 Annual Summary by Ports, 15 pp.
CFS-1819	- Frozen Fish Report, May 1958, 8 pp.
CFS-1825	- Massachusetts Landings, 1957 Annual Summary by Gear and Subarea, 15 pp.
CFS-1831	- Massachusetts Landings, February 1958, 4 pp.
CFS-1833	- Fish Meal and Oil, May 1958, 2 pp.
CFS-1835	- Frozen Fish Report, June 1958, 8 pp.
CFS-1836	- Alaska Fisheries, 1957 Annual Summary, 8 pp.
CFS-1837	- Georgia Landings, May 1958, 2 pp.
CFS-1838	- South Carolina Landings, May 1958, 2 pp.
CFS-1839	- Imports and Exports of Fishery Products, 1953-1957, 12 pp.
CFS-1840	- Fish Stick Report, April-June 1958, 2 pp.
CFS-1841	- Maine Landings, May 1958, 3 pp.
CFS-1842	- Shrimp Landings, March 1958, 6 pp.
CFS-1843	- Florida Landings, May 1958, 7 pp.
CFS-1844	- New York Landings, May 1958, 4 pp.
CFS-1845	- Mississippi Landings, May 1958, 2 pp.
CFS-1846	- Fish Meal and Oil, June 1958, 2 pp.
CFS-1847	- Ohio Landings, May 1958, 2 pp.
CFS-1848	- Massachusetts Landings, March 1958, 4 pp.
CFS-1850	- Frozen Fish Report, July 1958, 8 pp.
CFS-1851	- Georgia Landings, June 1958, 2 pp.
CFS-1852	- South Carolina Landings, June 1958, 2 pp.
CFS-1853	- Shrimp Landings, April 1958, 6 pp.
CFS-1854	- Massachusetts Landings, April 1958, 4 pp.
CFS-1855	- Middle Atlantic Fisheries, 1957 Annual Summary, 6 pp.
CFS-1856	- South Atlantic Fisheries, 1957 Annual Summary, 6 pp.
CFS-1857	- New Jersey Landings, June 1958, 4 pp.
CFS-1858	- Massachusetts Landings, May 1958, 5 pp.
CFS-1859	- Maine Landings, June 1958, 4 pp.
CFS-1860	- Ohio Landings, June 1958, 2 pp.

- CFS-1861 - New York Landings, June 1958, 4 pp.
CFS-1862 - Rhode Island Landings, April 1958, 3 pp.
CFS-1863 - California Landings, March 1958, 4 pp.
CFS-1864 - California Landings, April 1958, 4 pp.
CFS-1865 - Florida Landings, June 1958, 7 pp.
CFS-1866 - Rhode Island Landings, May 1958, 3 pp.
CFS-1867 - Alabama Landings, May 1958, 2 pp.
CFS-1873 - Ohio Landings, July 1958, 2 pp.
CFS-1876 - Rhode Island Landings, June 1958, 3 pp.

Wholesale Dealers in Fishery Products (Revised):
SL-8 - Pennsylvania, 1958
SL-40 - Oklahoma, 1958.

- FL-147 - List of Federal Fish-Cultural Stations, 7 pp., revised January 1958.
FL-448 - Some Publications on Fish Culture and Related Subjects, 11 pp., April 1958 (supersedes FL-6, August 1950).
FL-453 - Infectious Pancreatic Necrosis of Salmonid Fishes (Acute Catarrhal Enteritis), by S. F. Snieszko and Ken Wolf, 3 pp., July 1958.
FL-454 - Virus Disease of Sockeye Salmon, by Ken Wolf, 3 pp., July 1958.
FL-455 - Blue-Sac Disease of Fish, by Ken Wolf, 3 pp., July 1958.
FL-456 - White-Spot Disease of Fish Eggs and Fry, by Ken Wolf, 2 pp., July 1958.
FL-457 - Soft-Egg Disease of Fishes, by Ken Wolf, 2 pp., July 1958.
FL-458 - Lymphocystis Disease of Fish, by Ken Wolf, 4 pp., July 1958.
FL-459 - Freshwater Fish Diseases Caused by Bacteria Belonging to the Genera Aeromonas and Pseudomonas, by S. F. Snieszko, 6 pp., July 1958.
FL-461 - Columnaris Disease of Fishes, by S. F. Snieszko, 3 pp., July 1958.
FL-462 - Fin Rot and Peduncle Disease of Salmonid Fishes, by S. F. Snieszko, 2 pp., July 1958.
FL-463 - Nutritional (Dietary) Gill Disease (and Other Less Known Gill Diseases of Fresh-Water Fishes), by S. F. Snieszko, 2 pp., July 1958.
FL-464 - Bacterial Gill Disease of Fresh-Water Fishes, by S. F. Snieszko, 4 pp., July 1958.
FL-466 - Ulcer Disease in Trout, by Robert G. Piper, 3 pp., July 1958.

FL-467 - Fish Furunculosis, by S. F. Snieszko, 4 pp., July 1958.

FL-468 - Excise Tax Exemptions Granted to Fishermen, by Robert Hamlish, 2 pp., July 1958. Exemptions in the nature of tax relief are granted to fishermen from the payment of certain excise taxes under both Federal and State statutes.

SSR-Fish. No. 239 - Water Quality Studies in the Columbia River Basin, by Robert O. Sylvester, 138 pp., illus., May 1958.

SSR-Fish. No. 245 - Cod and Hydrography--A Review, by John P. Wise, 20 pp., illus., May 1958. The effect of hydrographic conditions on various parts of the life cycle of the cod has often been described in the literature. This paper is an attempt to correlate many reports and to compare them one with another. As a convenient method of handling the information and relating hydrography to the cod, the various phases in the biology of the fish are taken up in turn--spawning, eggs and larvae, feeding and growth, distribution and abundance of mature fish, and mortality. Under each segment of the life history the appropriate hydrographic phenomena are considered.

SSR-Fish. No. 256 - Length-Weight Relation in the Common or White Shrimp, *Penaeus setiferus*, by William W. Anderson and Milton J. Lindner, 13 pp., illus., May 1958. In order to determine the size at which a species can be most profitably taken, the relation between increase in mass weight of a shrimp population through growth and recruitment and decrease through mortality must be known. Information about length and weight as attributes of growth are essential in understanding this relation. This paper covers the results of a study of the length-weight relations for common or white shrimp from Texas.

SSR-Fish. No. 258 - Progress Report on Alaska Fisheries Management and Research, 1957, 28 pp., illus., June 1958. The U. S. Fish and Wildlife Service operates in Alaska under the general authority provided in the Congressional Act of June 18, 1926, commonly called the White Act, to protect and conserve the fisheries of Alaska. In accordance with the purposes outlined in the White Act, the administration of the commercial fisheries of Alaska has three principal functions: (1) To investigate the status of the fisheries resources and determine by scientific means whether they are yielding the maximum harvest and, if they are not, how this might be done; (2) to translate the scientific findings into management measures and regulations in order to achieve the maximum sustained yield; and (3) to enforce the fishery laws and regulations which apply in Alaskan waters. This progress report contains a brief description of the trends in the major Alaskan fisheries and the preliminary results of the research being done.

Sep. No. 522 - A Practical Depth Telemeter for Midwater Trawls.

Sep. No. 523 - Color and Quality of Canned Gulf of Mexico Yellowfin Tuna as Related to Weight of Fish.

Sep. No. 524 - 1957: The Year of Warm Water and Southern Fish off California Coast.

Sep. No. 525 - Research in Service Laboratories (September 1958): Contains these articles--"Enzymes in Fish Tissue Under Study," and "Improved Handling of Fish Aboard Massachusetts Fishing Vessels."

A Market Development Plan for the New England Groundfish Industry, Circular 53, 22 pp., July 1958. Presents background information which was secured from processors, distributors, and consumers of New England groundfish and reports the conclusions and recommendations developed largely from that background information. The report is based on a study made by a firm of marketing management consultants under contract to the U. S. Bureau of Commercial Fisheries with funds made available by the Saltonstall-Kennedy Act of 1954.

Regulations Governing Processed Fishery Products, July 1958 (First Issue), 26 pp.

United States Standards for Grades of Frozen Fish Blocks, July 1958 (First Issue), 6 pp.

United States Standards for Grades of Frozen Fried Fish Sticks, July 1958 (First Issue), 5 pp.

United States Standards for Grades of Frozen Raw Breaded Shrimp, July 1958 (First Issue), 5 pp.

THE FOLLOWING SERVICE PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

Production of Fishery Products in Selected Areas of Alabama, Florida, Louisiana, Mississippi, and Texas, 1957, by Peter DiMarco, 35 pp., processed, July 1958. (Available free from the U. S. Fish and Wildlife Service, 609-611 Federal Bldg., 600 South St., New Orleans, La.) The first part reports on trends and conditions in Gulf Coast fisheries during 1957 and gives a resume of the individual fisheries. For the shrimp fishery, a detailed account is presented of general conditions, total landings by species and states, composition of the landings by species, total landings by sizes and species, consumption data, prices, canned shrimp, sun-dried shrimp, imports, and cold-storage data. Discusses production and market conditions for the oyster, blue crab, and finfish fisheries, as well as the Gulf tuna fishery and imports of fresh and frozen fish and shellfish. The second part includes shrimp closed seasons in effect in the Gulf States during 1957, minimum shrimp size regulations, conversion factors and container capacities, and shrimp sizes. The second part also contains statistical tables showing total fishery products landings by areas and species, by species and months by areas and species by months; crab meat production by areas and months; fishery imports through the New Orleans Customs District and Port Isabel and Brownsville, Tex.; and LCL express shipments from New Orleans for 1957 by months and destination. Also included are tables showing monthly range of wholesale prices of fishery products on the New Orleans French Market; Gulf States weekly oyster and shrimp packs, 1956/57 season;

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Gulf States canned shrimp pack by seasons for a 5-year period; summary of Gulf shrimp landings for selected areas, 1956-57 and 5-year averages; and fishery products market classifications in the Gulf area. The areas covered by the report are: Mobile and Bayou LaBatre, Ala.; Apalachicola, Fla.; Pascagoula and Biloxi, Miss.; New Orleans and Lower Mississippi River, Golden Meadow, Houma, Chauvin, Dulac, Morgan City, Berwick, Patterson, and Delcambre, La.; and Port Arthur, Sabine Pass, Galveston, Freeport, Port Lavaca, Palacios, Aransas Pass, Rockport, Corpus Christi, Port Isabel, and Brownsville, Tex.

Receipts of Fresh and Frozen Fishery Products at New York City's Fulton Fish Market, 1957 (Includes Statistics and Marketing Trends), by T. J. Risoli, 43 pp., processed. (Available free from the Market News Service, U. S. Bureau of Commercial Fisheries, 155 John St., New York 38, N. Y.) The first part of this annual summary of New York City's Fulton Market receipts of fresh and frozen salt-water fishery products discusses the marketing trends for 1957. The subjects covered are: a comparison of New York City's Fulton Market Salt-Water Section receipts of finfish and shellfish, leading finfish species, shad receipts and prices, general marketing trends and conditions that affected the marketing of fishery products, New York City wholesale oyster prices, annual summary and analysis of receipts of finfish on New York City's Wholesale Fresh-Water Market, and a number of other related subjects. The second part of this annual report consists of a series of statistical tables giving the receipts of fish and shellfish in the Salt-Water Section of New York City's Fulton Fish Market by months and method of transportation; by species, method of transportation and states and provinces; and by points of origin and methods of transportation. Also includes imports of selected fresh and frozen fishery products for 1957 as compared with 1956.

California Fishery Products Monthly Summary, May 1958; June 1958; July 1958; 12 pp. each. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif.) California cannery receipts of raw tuna and tunalike fish, herring, mackerel, anchovies, and squid; pack of canned tuna, herring, mackerel, anchovies, and squid; market fish receipts at San Pedro, Santa Monica, San Diego, and Eureka areas; California imports; canned fish and frozen shrimp prices; American Tuna Boat Association auction sales; for the months indicated.

(Chicago) Monthly Summary of Chicago's Fresh and Frozen Fishery Products Receipts and Wholesale Market Prices, July 1958, 12 pp. (Market News Service, U. S. Fish and Wildlife Service, 565 W. Washington St., Chicago 6, Ill.) Receipts at Chicago by species and by states and provinces; fresh-water fish, shrimp, and frozen fillet wholesale prices; for the month indicated.

Gulf Monthly Landings, Production, and Shipments of Fishery Products, June 1958; July 1958, 6 pp. each. (Market News Service, U. S. Fish and Wildlife Service, 609-611 Federal Bldg., New

Orleans 12, La.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; and wholesale prices of fish and shellfish on the New Orleans French Market; for the months indicated.

Monthly Summary of Fishery Products in Selected Areas of Virginia, North Carolina, and Maryland, July 1958; August 1958; 4 pp. each. (Market News Service, U. S. Fish and Wildlife Service, 18 So. King St., Hampton, Va.) Fishery landings and production for the Virginia areas of Hampton Roads, Lower Northern Neck, and Eastern Shore; the Maryland areas of Crisfield, Ocean City, and Cambridge; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data; for the months indicated.

New England Fisheries--Monthly Summary, June 1958; July 1958; 21 pp. each. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Reviews the principal New England fishery ports, presenting food fish landings by ports and species; industrial fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, Provincetown, and Woods Hole), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and landings and ex-vessel prices for fares landed at the Boston Fish Pier and sold through the New England Fish Exchange; for the months indicated.

(New York) Monthly Summary - Receipts of Fishery Products at the New York City Wholesale Salt-Water Market, June 1958, 15 pp. (Market News Service, U. S. Fish and Wildlife Service, 155 John St., New York 38, N. Y.) Receipts in the salt-water section of the Fulton Fish Market by species and by states and provinces; for the month indicated.

(Seattle) Monthly Summary - Fishery Products, July 1958, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, Pier 42 South, Seattle 4, Wash.) Includes landings and local receipts, with ex-vessel and wholesale prices in some instances, as reported by Seattle and Astoria (Oregon) wholesale dealers; also Northwest Pacific halibut landings; for the month indicated.

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Fishery Statistics of the United States, 1956, by E. A. Power, Statistical Digest No. 43, 476 pp., illus., printed, \$2.25, 1958. This is the latest in a series of annual statistical reports on the fisheries of the United States and Alaska, which contains data on the catch and ex-vessel value of fishery products, employment in the fisheries, quantity of gear operated, the number of

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fishing craft employed in the capture of fishery products, and certain information on the production and value of manufactured fishery products and byproducts. The statistical surveys, conducted during 1957 for 1956 data, covered all sections of the United States. The catch of fishery products in all sections of the United States and Alaska during 1956 totaled approximately 5.25 billion pounds valued at \$369 million ex-vessel—an increase of 10 percent in quantity and 10 percent in value as compared with 1955. Menhaden landings continued to climb and soared above 2 billion pounds, establishing a new record as the greatest annual catch of a single species ever made by United States fishermen. Shrimp was again the most valuable single item taken by domestic fishermen. The catch of these shellfish totaled 224.2 million pounds valued at \$70.9 million ex-vessel. The Gulf of Mexico was again the major shrimp-producing area, yielding 88 percent of the value of the total 1956 landings; however, commercial quantities of cocktail-size shrimp from the Washington Coast became significant in 1956, thus assuring further expansion of this fishery. Several of the major foodfish recorded noteworthy increases during the year: tuna and tunalike (up 59 million pounds); sea herring (up 129 million pounds); Alaska salmon (up 34.4 million pounds); jack mackerel (up 40 million pounds); and Pacific mackerel (up 27 million pounds). Increased landings were also made in the fisheries for Pacific halibut and haddock, and to a lesser extent, alewives, anchovies, catfish, bullheads, and flounder. Gains were also made in the landings of clams and crabs. The only major fisheries showing decreases in 1956 were Pacific sardines (which totaled less than half of the 1955 landings), ocean perch, oysters, and shrimp. Although landings of oysters and shrimp decreased, their value increased over that of 1955 due mainly to excellent consumer demand. The pack of canned fishery products in the United States, Alaska, Hawaii, Puerto Rico, and American Samoa in 1956 amounted to over 979 million pounds valued at \$350 million to the packers. Increased packs of tuna, Alaska salmon, Maine sardines, Pacific Coast mackerel, and fish packed for pet food were responsible for the gain in the total pack. Production of fresh and frozen packaged fish in the United States totaled nearly 163 million pounds valued at over \$47 million to the processors. This represented an increase of about 4 million pounds and \$3 million over the 1955 production. United States foreign trade in fishery products during 1956 was valued at \$321 million of which \$281 million represented imports and \$40 million the value of exports. The value of imported fishery products in 1956 established a new record over 1955, the former high year. Some of the most important imports during 1956 were fresh and frozen groundfish fillets and steaks (including blocks and slabs), shrimp, canned salmon, and canned tuna in brine. The value of exports in 1956 were almost the same as for 1955, but there were decreases in exports of canned salmon, canned sardines, cured fishery products, and fish and marine-animal oils. The economic data presented in this report are essential for use by

persons engaged in commercial fishery and by governmental agencies concerned with the regulation and protection of commercial fisheries. Biological information included, which is important to sound fishery management, provides detailed information of fluctuations in the commercial catch by species, locality, and gear, and type of craft operated. To assist persons interested in reviewing historical statistics of the domestic fisheries, this report contains a bibliography listing the sources of data on the fisheries of the various regions of the United States for the years 1880 to 1956.

Uptake and Accumulation of Radioactive Zinc by Marine Plankton, Fish, and Shellfish, by Walter A. Chipman, Theodore R. Rice, and Thomas J. Price, *Fishery Bulletin* 135 (From *Fishery Bulletin* of the Fish and Wildlife Service, vol. 58), 16 pp., illus., printed, 15 cents, 1958.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATION OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

ALASKA:

1956 Annual Report, Report No. 8, 118 pp., illus., printed. Alaska Department of Fisheries, Juneau, Alaska. This report covers the activities of the Alaska Fisheries Board and the Alaska Department of Fisheries for 1956. The statistical tables cover the preceding 10-year period, while the financial statement is based on the Territorial biennium from April 1, 1956, to March 31, 1957. The 1956 activities of the Biological Research Division continued the three field studies under way in 1955 on Taku River salmon, Kitoi Bay red salmon, and Kodiak king crab. A new research project was initiated on silver salmon in Southeast Alaska. This report also describes the education and information, engineering, inspection, marine predator control, sport fish, and watershed management programs. The statistical part of the report contains data on the comparative values of canned salmon by species, 1947-1956; number of canneries and salmon pack, 1947-1956; salmon catch by gear, species and district, 1947-1956; poundage and value of Alaska fisheries landings, 1947-1956; and poundage and value of Alaska fisheries products prepared for market, 1947-1956. In addition to a financial statement, the report concludes with a discussion of future plans of the Department.

ANGLERFISH:

A Deep Sea Ceratioid Anglerfish of the Genus GIGANTACTIS from Florida, by C. Richard Robins and Walter R. Courtenay, Jr., *Contribution* No. 201, 6 pp., illus., printed. (Reprinted from *Bulletin of Marine Science of the Gulf and*

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Caribbean, vol. 8, no. 2, June 1958, pp. 146-151.) The Marine Laboratory, University of Miami, Virginia Key, Miami 49, Fla.

ANIMAL FEEDING:

"Feeding of Whale Meat," by Dr. A. J. Wood, article, *National Fur News*, vol. 30, no. 4, May 1958, pp. 12, 61, printed, single copy 35 cents. Galen E. Boyles Co., Inc., 200 Clayton St., Denver 4, Colo. A discussion of the use of whale meat as a protein supplement in mink rations. Some recent analyses are presented of certain whale meats in comparison with various other protein supplements used in mink feeding. Another table compares the ration costs of two typical rations utilizing whale meat and horse meat. "To summarize," the author states, "it seems safe to conclude that whale meat may be canned to provide a completely safe and nutritionally valuable source of protein for mink feeding. The cost of this product when consideration is given to savings in storage costs and to protein quality will make it competitive with many of the other mink protein supplements."

"Fish Feeding Experiments," by W. S. Gunn and Ronald E. Howell, article, *National Fur News*, vol. 30, no. 4, May 1958, pp. 13, 62-63, printed, single copy 35 cents. Galen E. Boyles Co., Inc., 200 Clayton St., Denver 4, Colo. Describes mink-feeding experiments conducted at the Kellogg Research Farm, Michigan State University, during the past five years. Controlled experimental results support theoretical and practical evidence that certain fish can be used just as effectively as horse meat in commercial mink rations.

"Fishmeal and Fishflour in the Mink's Diet," by William L. Loeschke, article, *National Fur News*, vol. 30, no. 6, July 1958, pp. 10, 37, illus., printed. Galen E. Boyles Co., Inc., 200 Clayton Street, Denver 6, Colo. Reports on experimental studies of the nutritional value of fish meal and fish flour in mink diets. The primary purpose of these experiments is to establish standards for evaluating mink feed products.

"Know Your Atlantic Ocean Fish," by Dr. Kendall Dolge, article, *National Fur News*, vol. 30, no. 4, May 1958, pp. 10, 50-51, printed, single copy 35 cents. Galen E. Boyles Co., Inc., 200 Clayton St., Denver 4, Colo. The author discusses the major points in the use of Atlantic Ocean fish in the feeding of mink. He gives the following helpful suggestions to mink ranchers: (1) Avoid spoilage of fish by careful handling on your own ranch, and by careful selection of your supplier; (2) If you feed fish known to contain thiaminase, either cook the fish before feeding or feed only on alternate days; (3) Don't feed any single species at over 15-20 percent until you know by your own experience it is safe. Be especially careful not to feed too high a percentage of hake; (4) Use a variety of fish and fish products. There is safety in numbers; (5) Know the composition of the fish you are feeding and properly supplement it; and (6) Keep up with the research being conducted at universities throughout the country. Help whenever and however you can."

AUSTRALIA:

Fishing and Whaling, Australia, 1956-57, Statistical Bulletin No. 3, 18 pp., illus., processed. Commonwealth Bureau of Census and Statistics, Canberra, Australia. A statistical report in two parts. The first part covers fisheries for 1956-57 with comparative data for the previous four years, presenting details on the quantity and value of landings by states; total quantity and value of landings; vessels, gear, and number of persons engaged in the fisheries; fish processing; imports, exports, and consumption of fresh and processed fish; production of fresh fish; production of fish by species and states; total production of fish by species; production of major fish species; production of crustaceans and mollusks by states; and pearl and trochus shell production. The second part summarizes Australian whaling statistics for five seasons, 1953-57.

BAIT FISH:

"The Intestine as a Diagnostic Character in Identifying Certain Clupeoids (Engraulidae, Clupeidae, Dussumieriidae) and as a Morphometric Character for Comparing Anchoveta (*Cetengraulis mysticetus*) Populations," by Wilhelm Harter, article, *Inter-American Tropical Tuna Commission, Bulletin vol. II, no. 8, 1958, pp. 367-388, illus., printed in English and Spanish.* Inter-American Tropical Tuna Commission, La Jolla, Calif.

BLUE RUNNER:

Early Development and Larval Distribution of the Carangid Fish, *CARANX CRYOS* (Mitchell), by Thomas W. McKenney, Elizabeth C. Alexander, and Gilbert L. Voss, Contribution No. 207, 33 pp., illus., printed. (Reprinted from *Bulletin of Marine Science of the Gulf and Caribbean*, vol. 8, no. 2, June 1958, pp. 167-200.) The Marine Laboratory, University of Miami, Virginia Key, Miami 49, Fla. Describes and illustrates the early development of the blue runner, *Caranx cryos*. Also discusses distribution of the species, its food habits, spawning, growth, temperature, and the salinities and depths of water in which it is captured.

BRAZIL:

Jangadeiros (Raftsmen), by Luis da Camara Cascudo, Documentario da Vida Rural No. 11, 60 pp., illus., printed in Portuguese with summary in English. Ministerio da Agricultura, Servico de Informacao Agricola, Rio de Janeiro, Brazil, 1957. Presents an account of fishing rafts and raftsmen of Brazil. Raft fishing provides a large amount of the fish consumed in Brazil. The author gives details of the raft fishing and describes the methods used for preparing food fish in the north coast of Brazil.

BELGIUM:

Officiele Lijst der Belgische Vissersvaartuigen, 1958 (Official List of Belgian Motor Fishing Vessels, 1958), 75 pp., printed in Dutch. Ministerie van Verkeerswezen, Brussels, Belgium.

CALIFORNIA:

The Marine Fish Catch of California (For the Years 1955 and 1956), Fish Bulletin No. 105,

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

104 pp., illus., printed. Department of Fish and Game, Sacramento, Calif., 1958. Tables published in this bulletin supply the complete available record of all fish, mollusks, and crustaceans landed in California by commercial fishing vessels or shipped into California for processing. Statistical data cover annual landings and shipments, 1916-1956; commercial fish landings and shipments, 1955 and 1956; value of commercial fish landings and shipments, 1955 and 1956; licensed commercial fishermen; registered commercial vessels; origin of shipments, 1955 and 1956; origin of commercial fish landings, 1955 and 1956; monthly landings and shipments, 1955 and 1956--statewide; monthly landings and shipments, 1955 and 1956--by regions; value and poundage, annual landings by regions, 1955 and 1956; value and poundage by ports and regions, 1955 and 1956; sport catch, 1947-1956; and live bait catch, 1952-1956. In addition to the statistical data, this bulletin includes an article entitled "Rockfish Review," by J. B. Phillips; a list of common and scientific names of fishes, crustaceans, and mollusks; and an explanation of the tables.

CANADA:

Fisheries Statistics of Canada, 1956 (Ontario, Prairie Provinces, and Northwest Territories), 71 pp., printed in French and English, 50 Canadian cents. Queen's Printer and Controller of Stationery, Ottawa, Ontario, Canada, 1958. Consists of tables giving the value of the principal species of inland fish landed, 1949-56; quantity and value of landings by species and fisheries districts, 1955-56; capital equipment used in the primary fisheries operations; and the number of persons engaged in the fisheries. This information is presented separately for the provinces of Ontario, Manitoba, Saskatchewan, and Alberta, and for the Northwest Territories.

Operations of Modern Longliners and Druggers, Atlantic Seaboard, 1957, by John Proskie, Primary Industry Series No. 1, vol. 7, Part 2, 62 pp., processed. Department of Fisheries of Canada, Economics Service, Ottawa, Ontario, Canada, 1958. A statistical report covering the operations of modern fishing vessels in the Canadian Atlantic provinces. Presents tables summarizing the description of vessels, capital cost, financing, and ownership; fishing activities; landings and landed values; prices, receipts, expenditures, and net returns; fishing effort and returns; geographic operational areas; and seasonal fishing effort and landings.

"Some Observations on the Schooling Movements of the Alewife in Lake Ontario," by Joseph J. Graham, article, The Canadian Field-Naturalist, vol. 71, no. 3, July-September 1957, pp. 115-116, printed. Ottawa Field Naturalists' Club, Science Service Building, Ottawa, Ontario, Canada.

CANNING:

"Beretning fra Hermetikkindustriens Laboratorium 1953, 1954, 1955" (Reports from the Canning Industry Laboratory, 1953, 1954, and 1955), by E. Mathiesen, articles, Tidsskrift for Hermetikkindustri, vol. 40, 1954, pp. 560-564, 567-569; vol.

42, 1956, pp. 68-70, 73-79, 489-490, 492-494, 497-500, 503-505, printed in Norwegian. Hermetikkindustriens Laboratorium, Stavanger, Norway. Describes the work of the Norwegian Canning Industry Laboratory at Stavanger, Norway, during the years 1953, 1954, and 1955. Reports on raw materials, pretreatment of raw materials, auxiliary materials, containers used, canned products and their manufacture, other preserved products, machines and equipment, and other activities.

"The Formation of Magnesium Ammonium Phosphate Crystals in Canned Sea Foods--III. The Crystallizing State of Chemically Synthesized Crystals at Various Temperatures; IV. Formation of the Crystals of $MgNH_4PO_4 \cdot 6H_2O$ and its Minimum Ion Concentration; and V. The Growth of the Crystals of $MgNH_4PO_4 \cdot 6H_2O$ in Glass Vessel," by E. Tanikawa, Y. Nagasawa, and T. Sugiyama, articles, Bulletin of the Faculty of Fisheries, Hokkaido University, vol. 8, 1957, pp. 59-73, printed. Faculty of Fisheries, Hokkaido University, Hakodate, Japan.

CHEMICAL COMPOSITION:

The Biochemical Composition of Fish, by R. M. Love, Department of Scientific and Industrial Research, Memoir No. 1106, 17 pp., illus., printed. Department of Scientific and Industrial Research, Food Investigation Organization, Torry Research Station, Aberdeen, Scotland.

CHESAPEAKE BAY:

"The Fishing Craft of the Chesapeake Bay," by Robert H. Burgess, article, The Commonwealth, vol. 15, no. 7, July 1958, pp. 19-22, 36-37, illus., printed. The Virginia State Chamber of Commerce, 111 North Fifth St., Richmond 19, Va. Presents a historical review of the types of vessels used, past and present, in the fisheries of the Upper Chesapeake Bay. Discusses the designs of vessels--especially oyster dredgers--made to conform to the special demands of weather and local conditions.

COD:

"Aspectos Tecnologicos da Preparacao de Bacalhau desde a Captura a Secagem--Elementos Historicos" (Technological Aspects of the Processing of Cod from Its Landing to Drying--Historical Elements), by Dr. A. Torres Botelho, article, Boletim da Pesca, vol. 11, no. 59, June 1958, pp. 11-37, printed in Portuguese. Gabinete de Estudos das Pescas, R. S. Bento, 644, 4.º -Esq., Lisbon, Portugal.

Bear Island Cod--Prospect for 1958, Ministry of Agriculture, Fisheries and Food Laboratory Leaflet No. 19, 10 pp., illus., processed. Ministry of Agriculture Fisheries and Food, Fisheries Laboratory, Lowestoft, England, April 1958.

"Chemical Changes Occurring in Cod Muscle during Chill Storage and Their Possible Use as Objective Indices of Quality," by J. M. Shewan and N. R. Jones, article, Journal of the Science of Food and Agriculture, vol. 8, 1957, pp. 491-498, printed. Society of Chemical Industry, 14 Belgrave Square, London, SW1, England.

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"Influence of Intermittent Short Storage Periods at 15° F., as Encountered during Refrigerator Car Transportation, on the Quality of Frozen Cod Stored at 0° F.," by W. J. Dyer, D. I. Fraser, D. G. Ellis, and W. A. MacCallum, article, *Journal of the Fisheries Research Board of Canada*, vol. 14, 1957, pp. 627-635, printed. Fisheries Research Board of Canada, Ottawa, Ontario, Canada.

COMMISSION:

Annual Report 1957, International Pacific Salmon Fisheries Commission, 44 pp., illus., printed. International Pacific Salmon Fisheries Commission, New Westminster, Canada, 1958. A report of the Commission, an international agency appointed under a convention between Canada and the United States for the protection, preservation, and extension of the sockeye salmon fisheries in the Fraser River system. The ratification of the Pink Salmon Protocol on July 3, 1957, transferred the primary responsibility for protecting, preserving, and extending the pink salmon fishery of the Fraser River system to the International Pacific Salmon Fisheries Commission. To permit the Commission to fulfill its new terms of reference in respect to the pink salmon, all of the responsibilities of the Commission relating to sockeye salmon including the right to regulate the fishery in Convention waters, were broadened, effective immediately, to include pink salmon. Since the pink salmon occur in significant numbers in Convention waters only on the odd-numbered years and the 1957 run was due to start in a few weeks after the ratification of the Protocol, only a cursory examination of the available historical data was possible prior to the formulation of the 1957 regulations. Discussed in this report are the various activities of the Commission during 1957 and the 1957 regulations. The sockeye salmon report discusses the United States fishery, the Canadian fishery, escapement, rehabilitation of barren areas, and general investigations. The pink salmon report discusses the 1957 pink salmon fishery, escapement, and the management research program.

CRAYFISH:

"Wisconsin Crayfish," by C. W. Threinen, article, *Wisconsin Conservation Bulletin*, vol. 23, no. 7, July 1958, pp. 13-15, illus., printed. Wisconsin Conservation Department, Madison 1, Wisc. Presents a brief report on the life history and edibility of five species of crayfish common in Wisconsin.

DEHYDRATION:

"The Effects of Dehydration on Actomyosin in Fish and Beef Muscle," by Sheila M. V. Hunt and N. A. Matheson, article, *Food Technology*, vol. 12, no. 8, August 1958, pp. 410-416, illus., printed, single copies of periodical--domestic US\$1.50, foreign US\$1.75. (Published by the Institute of Food Technologists.) The Garrard Press, 510 North Hickory, Champaign, Ill. Changes which occur in actomyosin of beef and cod muscle as a result of dehydration are discussed. On dehydration, cod actomyosin becomes insoluble and the muscle fibers may or may not lose their

power to contract, though about half the adenosine triphosphatase activity is not destroyed.

DENMARK:

Fiskeribetning for Aret 1957 (The Ministry of Fisheries Annual Report for 1957), 147 pp., illus., printed in Danish with English summary. Fiskeriministeriet, I. Kommission Hos G. E. C. Gad, Copenhagen, Denmark. A report on the Danish fishing industry for the year 1957. Presents statistical data on the number of fishermen fishing vessels, gear, and nets; landings of fish and shellfish; trout produced in ponds; amount of fish used for filleting, smoking, and canning; fish meal and oil production; exports of fresh and processed fishery products; and imports of fish and shellfish.

FISHERY STATISTICS:

Purpose and Methods in Fishery Statistics (Report of the First International Meeting on Fishery Statistics held in Copenhagen, Denmark, 26th-30th May 1952), edited by G. M. Gerhardsen, 371 pp., printed in English with a few papers in French. (Available from United States Mission to the United Nations, 2 Park Avenue, New York 16, N. Y.) Food and Agriculture Organization of the United Nations, Rome, Italy. The purpose of this report is to give a detailed account of the First International Meeting on Fishery Statistics, which was organized by the Food and Agriculture Organization of the United Nations in Copenhagen, Denmark, on May 26-30, 1952. The report is based on papers which were written for the meeting on purposes and methods in fishery statistics. The discussions and papers have been grouped under the following chapters: (1) Introduction and Summary Report; (2) The Need for Fishery Statistics and the Degree of Accuracy Required; (3) Collection of Fishery Statistics; (4) Fishing Craft Statistics; (5) Statistics on Fish Processing, Marketing, and Distribution; (6) Fishery Products in External Trade Statistics; and (7) Presentation of Fishery Statistics with Special Reference in International Comparison. "The participants in the meeting came largely from Europe and North America, but many of the problems referred to are universal, and," states the editor, "it is hoped that this symposium on fishery statistics will be found useful in all progressive fishery countries of the world. Current interest in the development of fisheries which is likely to become even more marked in the years to come, points to the indispensable need for accurate statistics for which a thorough knowledge of the purpose and methods is an obvious prerequisite. It is for this reason that this report, though essentially a record of the proceedings of a meeting is being made available not only to participants but to all interested in its subject matter."

FISH MEAL:

"Sulla Determinazione dell'Azoto Proteico nelle Farine di Pesce" (The Determination of Protein Nitrogen in Fish Meal), by B. M. C. Ricotta and R. Sara, article, *Conservare e Derivati Agrumari*, vol. 5, 1956, pp. 194-198, printed in Italian. Centro Sperimentale per l'Industria delle Conservare Alimentari della Regione Siciliana, Palermo, Italy.

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FLORIDA:

A Survey of the Number of Anglers and of Their Fishing Effort and Expenditures in the Coastal Recreational Fishery of Florida, by Robert W. Ellis, Albert Rosen, and Alan W. Moffett, Technical Series No. 24, 50 pp., illus., printed. The Marine Laboratory, University of Miami, Virginia Key, Miami 49, Fla., May 1958. Report on a study of the sport fishing in the salt and brackish waters of Florida made to determine the importance of this fishery to the economy of the State, to focus public attention on its importance, and to obtain information which will aid in the formulation of wise management laws.

FREEZING:

"Changes in the Myosin Fraction of Fish Muscle due to Freezing, Storage, and Thawing," by Olavi E. Nikkila, article, *Nordisk Kjølemote*, 1957, pp. 3-7, printed in Swedish. Fiskeridirektoratet, Industriavdelingen, Postboks 188, Bergen, Norway.

FREEZING FISH AT SEA:

The Development of a Quick-Freezing Plant for Deep Sea Trawlers, by G. C. Eddie, R. T. Hales, and D. W. Higman, paper read before Institute of Refrigeration, London, March 1957, 9 fig., 6 ref. Institute of Refrigeration, London, England.

FROZEN FISH:

"The Basis of Fish Glazing," by A. Piskarev and S. Gakichko, article, *Bulletin of the International Institute of Refrigeration*, vol. 35, 1955, p. 560, printed. (Reprinted from *Kholod. Tekh.* (U. S. S. R.), vol. 31, no. 4, 1954, pp. 36-39.) International Institute of Refrigeration, 177 Boulevard Malesherbes, Paris 17^e, France.

"Effect of Glazing on Quality, Preservation, and Extension of Storage Life of Frozen Fish," by A. Piskarev, article, *Bulletin of the International Institute of Refrigeration*, vol. 35, 1955, p. 130, printed. (Reprinted from *Kholod. Tekh.* (U. S. S. R.), vol. 31, no. 3, 1954, pp. 51-54.) International Institute of Refrigeration, 177 Boulevard Malesherbes, Paris 17^e, France.

"Esperimenti di Conservazione di Filetti di Pesce Mediante Congelamento" (Experiments on the Preservation of Fish Filets by Freezing), by G. Botalla, O. Brusa, A. Daghetta, and A. Monzini, article *Annali della Sperimentazione Agraria*, vol. 10, 1956, pp. 1651-1661, printed in Italian with English summary. Ministero della Agricoltura e della Foreste, Rome, Italy.

"Handling Frozen Sea Food," by C. Butler, article, *Refrigerating Engineering*, vol. 64, no. 8, 1956, pp. 52-53, printed. American Society of Refrigerating Engineers, 234 Fifth Avenue, New York 1, N. Y.

"Method of Heat Calculation in the Process of Glazing Fish," by Ya. Shneider, article, *Bulletin of the International Institute of Refrigeration*, vol. 34, 1954, p. 472, printed. (Reprinted from *Kholod. Tekh.* (U. S. S. R.), vol. 30, no. 2, 1953, pp. 57-61.) International Institute of Refrigeration, 177 Boulevard Malesherbes, Paris 17^e, France.

"Temperature Measurements on Frozen Fish during Road Transport," by D. L. Nichol and J. Lawrence, article, *Modern Refrigeration*, vol. 59, 1956, pp. 316-319, printed. Modern Refrigeration, Victoria Road, Woking, Surrey, England.

GENERAL:

"Egyptian Conservation," by Ednard Waldo, article, *Louisiana Conservationist*, vol. 10, no. 7-8, July-August 1958, pp. 14-15, 19-20, illus., printed. Louisiana Wild Life and Fisheries Commission, 126 Civil Courts Bldg., New Orleans, La. Discusses recent discoveries of ancient Egyptian bas reliefs and drawings which show that 5,000 years ago Egyptians were expert at the art of raising game and food fish--especially tilapia and Nile perch.

Journal du Conseil, vol. XXIII, no. 2, 169 pp., illus., printed. Conseil Permanent International pour l'Exploration de la Mer, Charlottenlund Slot, Denmark, April 1958. Contains, among others, the following articles: "The World's Southernmost Indigenous Cod," by John P. Wise; "Reactions of Fish to Artificial Light, With Special Reference to Large Herring and Spring Herring in Norway," by Olav Dragesund; "On the Shape of Herring Schools," by G. C. Bolster; and "Diet-Induced Variation in the Free Amino Acid Complex of *Sardinops caerulea*," by David A. Farris.

Living Resources of the Sea, by Lionel A. Walford, 336 pp., illus., printed, \$6. The Ronald Press Co., New York, 1958.

This unusual book, by the former Chief of the Branch of Fishery Biology of the U. S. Fish and Wildlife Service, is the report of a study made for The Conservation Foundation on the opportunities for research and for an expansion of the harvest from the sea.

The author recognizes the urgency of the need of increased and unfailing supplies of food from the sea for the rapidly growing world population and starts his study with three basic assumptions: (1) We have not yet learned how to exploit the food resources of the sea fully; (2) scientific research will show the way; (3) there are gaps in present research programs which need filling. He then proceeds for the next six chapters to review the gaps rather than the substance of our knowledge in the several sciences which contribute to fishery science. He explores the popular hope that the ultimate food source, the marine plankton, can be harvested and shows the difficulties of fish farming in brackish waters. He points out the need for improving old methods of discovery and capture of fish--the need of developing entirely new principles and methods.

Part II of the book is a condensed review of the character and suspected extent of the several classes of food sources, invertebrates, fishes, reptiles, mammals, and seaweeds. The last chapter is a summing up and a looking forward.

The author takes a properly cautious and conservative view of the prospects concluding

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that there are vast opportunities for research, too few researchers being trained, and, because of geographic, economic, and ethnic difficulties, little chance of a greater even an early increase (by more than a factor or two) of the world's food from the sea.

The book is very readable and entertaining as well as informing and stimulating for the thoughtful reader. The style is flowing, and the whole book is remarkably free of minor errors. It amply fulfills its principal aim of directing and encouraging marine fishery research by extending the horizons of present-day thinking.

--Elmer Higgins

GREAT LAKES:

Great Lakes Fauna, Flora, and Their Environment--A Bibliography, by John Van Oosten, 86 pp., processed. Great Lakes Commission, Ann Arbor, Mich., 1957. A bibliography on the fauna, flora, and limnology of the Great Lakes, compiled partly as a result of the international and national interest in the Great Lakes that has grown in recent years due to the havoc wrought by the sea lamprey on the fisheries. The publications listed are indexed under broad subjects. The section on fish covers biology; parasites and diseases; taxonomy, catalogs, and records; culture; and fisheries.

HERRING:

Luftfrysing av Sild--Undersøkelse av Nodvendig Frysetid (Air-Blast Freezing of Herring--Research on Freezing Time Needed), by Gustav Lorentzen, Report on Technological Research Concerning Norwegian Fish Industry, vol. III, No. 9, 30 pp., illus., printed in Norwegian with summary in English. A. S. John Griegs Boktrykkeri, Bergen, Norway, 1958. The results of a study of the content of fat and fat-free dry material of the Norwegian winter herring, based upon industrial analysis of a great number of separate catches during the years 1930-56.

Vintersildas Innhold av Fett og Fettfritt Torrstoff i Arene 1930-1956 (Amount of Fat in Winter Herring and Fat-Free Dry Material in the Year 1930-1956), by Sivilingenior Einar Flood, Report on Technological Research Concerning Norwegian Fish Industry, vol. III, no. 5, 9 pp., illus., printed in Norwegian with summary in English. A. S. John Griegs Boktrykkeri, Bergen, Norway, 1958. The results of a study of the content of fat and fat-free dry material of the Norwegian winter herring, based upon industrial analysis of a great number of separate catches during the years 1930-56.

ILLINOIS:

What Fish is This? by Al Lopinot, 23 pp., illus., printed. Illinois Department of Conservation, Division of Fisheries, 121 State House, Springfield, Ill. Consists of identification charts to aid in identifying some of the fish caught in Illinois.

INDEXES:

Index to the Publications of the Fishing Industry Research Institute for the First Ten Years, 1947-1957, compiled by J. S. Dunn, 65 pp.,

printed. Fishing Industry Research Institute, Cape Town, South Africa, 1958. This index covers the publications issued during the first ten years of the Fishing Industry Research Institute's existence.

IRRADIATION PRESERVATION:

"Comportamento dei Filetti di Pesce Refrigerati dopo Irradiazione con Luce Ultravioletta" (Behavior of Refrigerated Fish Fillets after Irradiation with Ultraviolet Light), by A. Monzini and G. Botalla, article, Annali della Sperimentazione Agraria, vol. 10, 1956, pp. 1447-1455, printed in Italian with English summary. Ministero della Agricoltura e della Foreste, Rome, Italy. Describes experiments in which fish fillets of hake (*Merluccius merluccius*), sealed in cellophane bags, were irradiated for 1 or 2 hours and then stored at 1° C. (33.8° F.) for up to 240 hours. Reports on the changes in the external appearance and chemical composition of the fish.

"Food Preservation by Radiation as of 1958--A Report to Management," by Kevin G. Shea, article, Food Technology, vol. 12, no. 8, August 1958, pp. 6-16, printed, single copies of periodical--domestic US\$1.50, foreign US\$1.75. (Published by the Institute of Food Technologists.) The Garrard Press, 510 North Hickory, Champaign, Ill. Discusses the activities of the Interdepartmental Committee on Radiation Preservation of Food which was formed to coordinate the government effort in food irradiation and to bring radiation preservation into industrial use. Contains a report on the work being done on the preservation of food (including fishery products) by irradiation.

LABORATORIES:

"New Marine Research Lab," article, Louisiana Conservationist, vol. 10, no. 4, April 1958, pp. 4-5, 8, illus., printed. Louisiana Wild Life and Fisheries Commission, 126 Civil Courts Bldg., New Orleans, La. Describes the dedication of the U. S. Bureau of Commercial Fisheries' new fishery laboratory at Pascagoula, Miss., which will be a center of marine research in the Gulf of Mexico. The new building houses laboratories and offices for exploration and technological work. Two vessels, the Oregon and the Silver Bay, are also used to discover new fishery resources and to develop improvements for gear used by commercial fisheries. The basic purpose of this laboratory is to assist the commercial fishing industry in solving technical problems in the processing of marine products, in developing new products, and suggesting new uses for products now in production. An outline of the projects under way and plans for future operations are discussed.

LOBSTER:

"Quick Frozen Scampi," by J. L. Rogers, article, Food Trade Review, vol. 27, no. 8, 1957, pp. 15, 18, printed. Food Trade Review, Ltd., 7 Garrick St., London W. C. 2, England. Describes the harvesting, processing, and packing of scampi, *Nephrops norvegicus*.

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"Yellow Discoloration and Deterioration in Frozen Lobster Meat," by E. G. Bligh, W. J. Dyer, and D. C. Horne, article, Journal of the Fisheries Research Board of Canada, vol. 14, 1957, pp. 637-644, printed. Fisheries Research Board of Canada, Ottawa, Ontario, Canada.

MARITIME ACCIDENTS:

Convenio Internacional para la Unificacion de Ciertas Reglas Relativas a la Competencia Penal en Materia de Abordaje u Otros Accidentes de Navegacion (International Conference on Some Regulations Pertaining to Legal Competence in Relation to Maritime Accidents)--Brussels, May 10, 1952, 7 pp., printed in Spanish. Imprenta del Ministerio de Asuntos Exteriores, Madrid, Spain, 1953.

MENHADEN:

"The Bountiful Menhaden," by Bernard L. Gordon, article, Nature Magazine, June-July 1958, vol. 51, no. 6, pp. 322-323, 332, illus., printed, single copy 50 cents. American Nature Association, 1214 16th St., NW., Washington, D. C. A description of the menhaden, Brevortia tyrannus, which is found in Atlantic waters from Nova Scotia to Brazil. The author gives a brief history of the menhaden fishery, habits of the menhaden, methods of capture, and manufacture of menhaden oil, scrap, and meal. The menhaden is the king of the industrial fish-processing industry and furnishes great quantities of oil that is used in products like paint, printing inks, soaps, and insect sprays.

"The Timorous Menhaden," by Anthony Higgins, article, Monsanto Magazine, vol. 37, no. 3, Summer 1958, pp. 26-29, illus., printed. Monsanto Chemical Company, St. Louis 24, Mo. A report on the menhaden fisheries of the South Atlantic and Gulf coasts, briefly covering their history, economic importance, and fishery methods.

MOISTURE CONTENT:

"A Rapid Method for the Determination of Moisture Content in Fish Meat--I. Relation Between Error of Estimation and Fat Content," by Y. Tsuchiya and Y. Sato, article, Tohoku Journal of Agricultural Research, vol. 7, 1957, pp. 273-276, printed. Tohoku University, Sendai, Japan.

MUSSELS:

"The Freezing and Cold Storage of Mussels," by A. Banks and C. T. House, article, Modern Refrigeration and Air Control, vol. 61, no. 724, July 1958, pp. 686-688, printed. MacLaren House, 131 Great Suffolk St., London, S. E. 1, England. Describes experiments made on the preservation of cooked mussel meats which have shown that by the use of certain methods of cooking, freezing, and cold storage, frozen mussel meats can be kept in a virtually unchanged condition for periods of 8-9 months.

NEW JERSEY:

Annual Report, New Jersey Department of Conservation and Economic Development, Division of Fish and Game (For the Fiscal Year Commencing July 1, 1956, and Ending June 30, 1957), 68 pp., illus., printed. Department of Conserva-

tion and Economic Development, Trenton, N. J. Reports on the activities of the Division of Fish and Game during the fiscal year 1956/57; lists the adopted regulations for the 1957 season, known as the Fish and Game Code; and includes a section on law enforcement. A section of the report discusses the fisheries management program, the propagation and distribution of fish, the development of the Pequest River Trout Rearing Station, research and experimentation, Dingell-Johnson projects, population manipulation, introduction of new forage species, licenses for commercial fishing, and miscellaneous projects. Also includes statistics on total pounds of fish by species reported taken by fish pounds, 1956; New Jersey landings by species for the calendar year 1956; Hudson River shad industry; and Delaware River shad industry. A section is also included on wildlife management.

NEW ZEALAND:

Report of the Marine Department for the Year Ended 31 March, 1958, 87 pp., printed. Government Printer, Wellington, New Zealand, 1958. This report contains, among others, a section on the fisheries of New Zealand in 1957 which covers crayfish, fishing vessels and personnel, fish landings, methods of capture, landings by ports, review of the principal fishing ports, exports and imports, big-game fishing, fish-liver oil, the 1957 whaling season, oysters, toheroa, whitebait fishery, mussels, fresh-water fisheries and research, marine research, activities of the Fishing Industry Advisory Council, legislation, and a list of the scientific and common names of New Zealand's most important species of fish and shellfish. The section concludes with a series of tables giving detailed data on the fisheries.

NIGERIA:

Annual Report of the Federal Fisheries Service for the Year 1956-57, 10 pp., illus., printed. Federation of Nigeria Federal Government Printer, Lagos, Nigeria, 1958. Reports on the work of the Nigerian Federal Fisheries Service. Describes proposals for future development of the Service and discusses the results of research projects in sea fishing and fish culture.

OCEANOGRAPHY:

An Oceanographic Description of the Eastern Tropical Pacific, by Warren S. Wooster and Townsend Cromwell, Contributions from the Scripps Institution of Oceanography No. 996, 116 pp., illus., printed, \$5.00 paper. (Reprinted from Bulletin of the Scripps Institution of Oceanography, vol. 7, no. 3, pp. 169-282.) University of California Press, Berkeley, Calif., 1958.

OREGON:

Report of the Special Legislative Interim Fisheries Committee for 1955-1957, to the Governor of the State of Oregon and the Forty-Ninth Legislative Assembly, 32 pp., processed. Oregon State Fish Commission, 307 State Office Bldg. Portland 1, Ore.

OYSTERS:

Oyster Culture in Florida by Robert M. Ingle and F. G. Walton Smith, Educational Series No. 5,

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26 pp., illus., printed. State Board of Conservation, Tallahassee, Fla. revised May 1956. The objective of this booklet is to provide the information necessary for the successful development of the oyster industry throughout the State of Florida. A section on the life history of oysters describes how they live, breed, and how fast they grow; the enemies of oysters; where oysters are found and how they are collected. Another section tells what the oyster industry is worth and how it may be improved. Other sections contain discussions of oyster cultivation and food value, and recipes for cooking oysters.

"Vitamin Content of Fresh, Frozen Oysters," by E. A. Fieger, article, Quick-Frozen Foods, vol. 19, no. 4, 1956, pp. 152, 155, printed E. W. Williams Publications, Inc., 82 Wall St., New York 5, N. Y.

QUALITY:

"Normes de Fraicheur du Poisson Frais--I. Appreciation de l'Alteration du Poisson Frais par un Examen Organoleptique Systematique; and II. Etat Moyen du Poisson Frais dans Quelques Grands Centres Urbains" (Standards of Freshness of Fresh Fish--I. Assessment of the Deterioration of Fresh Fish by a Systematic Organoleptic Examination; and II. Average State of Fresh Fish in some Large Urban Centers), by F. Soudan, A. Daknof, J. Bazin, G. Chapel, Daspet, and E. Seynave, articles, Annales de la Nutrition e de l'Alimentation, Memoires Originales, vol. 11 1957, pp. 1-24, printed in French. Centre Nationale de la Recherche Scientifique, 45 Rue d'Ulm, Paris 5^e, France.

ROCKFISHES:

"Rockfish Review," by J. B. Phillips, article, The Marine Fish Catch of California, Fish Bulletin No. 105, pp. 7-25, illus., printed. California Department of Fish and Game, Sacramento, Calif., 1958. This article describes the past developments in the catch of rockfish (family Scorpaenidae) and gives the total annual landings in the Northern, Central, and Southern California areas for 1916-1956; and total landings of rockfish along the Pacific Coast of North America, exclusive of Mexico, for 1936-1956. It also discusses the types of gear used in commercial rockfish fishery off California, areas of landing, importance of species, products, regulations, research, and catch statistics. A list of proposed standardized group names for reporting commercial rockfish landings is also included.

SALMON:

"Investigation and Management of Atlantic Salmon in 1957," article, Trade News, vol. 10, no. 12, June 1958, pp. 3-23, illus., printed. Department of Fisheries of Canada, Ottawa, Canada. A review of the progress made during 1957 in Canada's Atlantic salmon research and management program. Part I, by C. J. Kerswill, P. F. Elson, and M. H. A. Keenleyside, deals with the research program and covers Atlantic salmon statistics; Miramichi salmon runs; recoveries of salmon tags applied in 1957, Miramichi area, N. B.; the behavior of young salmon; smolt mark-

ing and recovery of marked adults; effects of DDT spraying on other fishes; changes in Miramichi River insect populations after DDT spraying; observed effects of DDT spraying on food of young salmon; effects of DDT spraying in New Brunswick on future runs of adult salmon; relative toxicity of DDT and Malathion to salmon; introduction of aquatic insect larvae to the North Branch Big Seovole River, N. B.; hydroelectric developments and St. John River salmon; and studies aimed at improving young salmon production. Part II, by E. W. Burrige, is a review of field projects included in the general management program to study and improve the salmon's fresh-water habitat. This part discusses the salmon river surveys; adult salmon enumeration; downstream migrant sampling; early-late run experiment; hatchery production; experimental predator bird control; and adult salmon transfer.

"Japanese, U. S. Agree on Salmon," article, Business Week, July 12, 1958, p. 127, illus., printed, single copy 50 cents. McGraw-Hill Publishing Co., Inc., 99 N. Broadway, Albany 1, N. Y. Japanese and United States salmon packers have agreed on new ground rules for the North Pacific salmon fishery. The Japanese industry agreed to move its limits 5 degrees of longitude toward the west and to reduce its catch of fish in the next 5 degrees westward. The interests of the Pacific Northwest and Alaska salmon have thus been protected with respect to the 1958 catch. In the fall, the United States, Canadian, and Japanese governments are scheduled to resume their interrupted effort to settle the matter on the diplomatic level. Meanwhile, a 1953 treaty among the three countries is still in effect, and the business pact is only as enforceable as a business "understanding."

"Relation of Adult Pink Salmon Size to Time of Migration and Freshwater Survival," by Bernard Einar Skud, article, Copeia, No. 3, August 28, 1958, pp. 170-176, illus., printed. American Society of Ichthyologists and Herpetologists, 34th St. and Girard Ave., Philadelphia 4, Pa.

SCOTLAND:

The Ecology of Scottish Inshore Fishing Grounds--1. The Bottom Fauna of East Coast Grounds, by A. D. McIntyre, Scottish Home Department Marine Research, 1958, No. 1, 24 pp., illus., printed. Her Majesty's Stationery Office, 13A Castle St., Edinburgh 2, Scotland.

SEALS:

"Mutiny on the Rand," article, The Alaska Sportsman, vol. XXIV, no. 9, September 1958, pp. 16-17, 26-37, illus., printed, single copy 35 cents. Alaska-Northwest Publishing Co., Juneau, Alaska. An account of the early days among the sealers, with special reference to the sealing schooner C. D. Rand.

SHRIMP:

"Biochemical Methods for Determining Shrimp Quality--1. Study of Analytical Methods and 2. Survey of Market Frozen Breaded Shrimp," by Marcel Gagnon and Carl R. Fellers, article, Food Technology, vol. 12, no. 7, July 1958, pp.

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340-346, printed. The Garrard Press, 510 Hickory, Champaign, Ill. The first part of this article reports on biochemical, organoleptic, and bacteriological methods studied in relation to developing an objective test for estimating the degree of freshness in frozen breaded shrimp. The second part describes a survey of 144 samples of frozen breaded shrimp at the retail level by means of bacteriological and chemical tests.

"Norwegian Prawns--Preparation, Packaging, Freezing," by A. E. Hammond, article, *Food*, vol. 26, October 1957, pp. 378-380, 5 figs., printed. Tothill Press Ltd., 33 Tothill St., Westminster, London, S. W. 1, England.

"Vitamin Content of Fresh, Processed Shrimp," by A. F. Novak, E. A. Fieger, and M. E. Bailey, article, *Quick-Frozen Foods*, vol. 18, no. 12, 1956, pp. 64-65, printed. E. W. Williams Publications, Inc., 82 Wall St., New York 5, N. Y.

"What Became of the White Shrimp?" by Percy Viosca, Jr., article, *Louisiana Conservationist*, vol. 10, no. 7-8, July-August 1958, pp. 17-18, illus., printed. Louisiana Wild Life and Fisheries Commission, 126 Civil Courts Bldg., New Orleans, La. Reports on the decline of white shrimp landings in Louisiana since 1954 and discusses research being conducted to determine the causes. A preliminary theory under investigation is that prevailing drought conditions of recent years may have caused the shrimp decline.

"Zur Borsäurefreien Haltbarmachung von Frischen Speisegarnelen und Garnelenfleisch" (The Boric Acid-Free Preservation of Fresh Edible Shrimp and Shrimp Flesh), by W. Ludorff, C. Hennings, and K. E. Neb, article *Z. Lebensmitt. Unters. und -Forsch.*, vol. 105, 1957, pp. 96-105, printed in German. Verlag M. 8 H. Schaper Str. 20, Hannover, Germany. Reports on experiments showing that maintaining a sufficiently high temperature during the cooking of edible shrimp--mainly *Crangon vulgaris*--on board ship or on land, and adding certain commercial preservatives based on benzoic acid esters, makes it practicable to dispense with the use of boric acid for the preservation of shrimp.

SOUTH AFRICA:

Fishing Industry Research Institute, Eleventh Annual Report of the Director, 1st January 1957-31st December 1957, 54 pp., illus., printed. Fishing Industry Research Institute, Cape Town, South Africa. Includes functions and activities of the Institute and brief accounts of the progress in its program of research during 1957. Attention has been given to investigations covering fresh, frozen, smoked, salted, and dried fish; spiny lobster; fish canning; fish meal; fish flour; and routine inspections and analysis.

SPINY LOBSTER:

The Spiny Lobster Industry of Florida, by F. B. Walton Smith, Educational Series No. 11, 35 pp., illus., printed. State Board of Conservation, Tallahassee, Fla., June 1958. This paper con-

tains a description of the scientific research which has been conducted on the spiny lobster and gives a key for the identification of the western Atlantic spiny lobsters. A section on the biology of spiny lobsters covers their appearance, sexual characteristics, habitat, food and enemies, breeding habits and life history, migrations, measurements, moulting, and growth. The paper also describes experiments in the cultivation of spiny lobsters, the fishing methods used, and extent and value of the spiny lobster fishery. The section on spiny lobster fishery regulations covers methods and purposes of regulation, conservation of stocks, economic conservation, sociological considerations, enforcement of controls, and Florida regulations.

SPOILAGE:

"Changes in the Total Volatile Base, Volatile Reducing Substances and Bacterial Count as Indices of Fresh Water Fish Spoilage," by M. N. Moorjani, J. R. Iyengar, K. Visweswariah, D. S. Bhatia, and V. Subrahmanyan, article, *Food Technology*, vol. 12, no. 8, August 1958, pp. 385-386, illus., printed, single copies of periodical--domestic US\$1.50, foreign US\$1.75. (Published by the Institute of Food Technologists.) The Garrard Press, 510 North Hickory, Champaign, Ill. Contains the results of an investigation which was undertaken to assess the quality gradings of fresh-water fish by determining the changes in the volatile reducing substances and the total volatile base content.

SPONGES:

The Taxonomy of American Commercial Sponges, by M. W. deLaubenfels and John F. Storr, Contribution No. 193, 19 pp., illus., printed. (Reprinted from *Bulletin of Marine Science of the Gulf and Caribbean*, vol. 8, no. 2, June 1958, pp. 99-117.) The Marine Laboratory, University of Miami, Virginia Key, Miami 49, Fla. Presents a revised taxonomy of American commercial sponges. Describes four new species--including one from the Mediterranean Sea--and one new subspecies. Photographic plates of the species covered are included.

TERRITORIAL WATERS:

The Icelandic Fisheries' Limits, 16 pp., printed. Prentissmjojan Edda, Ltd., Reykjavik, Iceland, August 1958. Contains the historical background of Iceland's fishing industry, and discusses the main points in connection with the extension of the Icelandic fishery limits and the criticisms directed against it.

"The Law of the Sea? No! The Law of Survival," by H. S. Noel, and "Background to the Dispute" (As Expressed by the Ministry of Agriculture and Fisheries), articles, *World Fishing*, vol. 7, no. 7, July 1958, pp. 30-38, illus., printed. John Trundell, Ltd., St. Richards House, Eversholt St., London, N. W. 1, England. The first article is a report on the organization of the fishing industry in Iceland and opinions of the Icelanders on the need for a 12-mile fishing limit. This article describes the background of Iceland's fishing industry and fishing methods, and reviews the reasons underlying the proposal for

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the new fishing limit. The author cites some of the arguments for the 12-mile limit and states that "To summarize, Iceland regards an extension of her limits as an insurance for the future, and as a domestic rather than an international action. At the same time she is anxious to maintain good relations with other North Atlantic countries, and to avoid a swing of trade and dependence to the East." Catch comparisons in Icelandic waters give the figures for the three principal countries engaged in the fisheries around Iceland and show the changes that have taken place in their respective shares of the total catch. The second article gives the background to the current dispute.

TRAWL NETS:

"How to Match Trawl Size to Engine Power on Inshore Vessels," by W. Dickson, article, *World Fishing*, vol. 7, no. 7, July 1958, pp. 47-49, printed. John Trundell, Ltd., St. Richards House, Eversholt St., London, N. W. 1, England. This article gives instructions for using the correct size of trawl net in relation to the engine of a relatively small vessel.

TUNA:

"Vitaminer i Norsk Fisk--II. Vitaminer i Forskjellige Organer fra Makrellstørje (*Thunnus thynnus*) Fanget Untenfor Norges Vestkyst" (Vitamins in Norwegian Fish--II. Vitamins in Different Organs from Tuna (*Thunnus thynnus*) Caught off the West Coast of Norway), by O. R. Braekkan, K. Hansen, and T. Skogland, article, *Fiskeridirektoratets Skrifter, Serie Tech. Undersøkelser*, vol. 3, no. 3, 1955, pp. 1-18, printed in Norwegian with English summary. John Griegs Boktrykkeri, Bergen, Norway.

UNION OF SOUTH AFRICA:

Fisheries Development Corporation of South Africa--Thirteenth Annual Report (Covering Period 1st October, 1956 to 30th September, 1957), 16 pp., printed in English and Dutch. Fisheries Development Corporation of South Africa, Ltd., Sea-fare House, 68 Orange Street, Cape Town, Union of South Africa. Presents brief reports on the state of the fisheries industry; research and general activities of the Corporation, including oyster culture; and financial data.

UNITED KINGDOM:

Governmental Services to the Sea-Fish Industry of Great Britain, by F. M. G. Willson, FAO Fisheries Study No. 5, 127 pp., illus., printed, \$1.25. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, 1957. (Purchase from Columbia University Press, International Documents Service, 2960 Broadway, New York 27, N. Y.) A complete report of the services performed for the marine fisheries industry of the United Kingdom by its Government. Part I of the report describes the structure and organization of the marine fishing industry as it is at present, the governmental authorities which deal with the industry and the State. Part II of the report discusses the governmental services in detail at each stage of the progress of the fish from the

sea to the consumer. Data are also presented on scientific and technological research in connection with marine fisheries and with the organization that collects and diffuses statistical and other economic information. This report covers what services the Government provides, how it provides them, and to some extent, why it provides them, but it makes no attempt to appraise the policies on which the services are based or the techniques employed in administering them.

White Fish Authority, Seventh Annual Report and Accounts for the Year Ended 31st March, 1958, 48 pp., printed. Her Majesty's Stationery Office, London, England. Presents a general description of the White Fish Authority, its functions, income, expenditures, and fishery loans. Also includes sections on production of fishery products, marketing and distribution, research and experiments, training courses, and investigations.

VESSELS:

"25-Foot Motor Fishing Boat for Pacific Waters," by H. van Pel, article, *SPC Quarterly Bulletin*, vol. 8, no. 2, April 1958, pp. 26-27, 51, illus., printed, single copy 30 U. S. cents. South Pacific Commission, Noumea, New Caledonia. Presents a description and diagram of a 25-foot fishing boat, rigged for both motor and sail, specially designed by a South Pacific Commission fisheries officer for use in the South Pacific. The fishing boat is designed to incorporate the following features: seaworthiness; adaptability for a variety of fishing methods; safety in case of mechanical breakdown, by having sail as well as motor rigging; dry storage space for food and personal effects of crew; facilities for stowage for fairly long periods of time; and simplicity of structure and mechanism to facilitate local repairs and service.

Use of the Pleuger Active Rudder in Fishing Vessels, 4 pp., illus., printed. (Reprinted from *World Fishing*, December 1953--Translated from German and based on "Erster Einsatz eines Aktivruders in der Loggerfischerei," by F. Busmann, R. Ismer, and E. Masur, Hamburg, Germany, August 1952.) *World Fishing*, John Trundell Ltd., Temple Chambers, Temple Ave., London, E. C. 4, England.

WHALES:

"Antibiotic Preservation of Whale Carcasses," article, *Chemistry and Industry*, February 8, 1958, no. 6, pp. 167-168, printed. Chemistry and Industry, Society of Chemical Industry, 56 Victoria St., London, S. W. 1, England.

WEATHER CHARTS:

Coastal Warning Facilities Chart, 1958--Morgan City, La. to Apalachicola, Fla.; Morgan City, La. to Brownsville, Tex.; Eastern Florida; and Cape Hatteras to Brunswick, Ga., 4 charts, 2 pp. each, illus., processed, 5 cents each. Weather Bureau, U. S. Department of Commerce, Washington 25, D. C. (For sale by the Super-

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intendent of Documents, U. S. Government Printing Office, Washington 25, D. C.)

WHITEFISH:

"The Lake Whitefish," by F. A. Westerman, article, Michigan Conservation, vol. XXVII, no. 4, July-Aug. 1958, pp. 18-22, illus., printed. Michigan Department of Conservation, Lansing, Mich. Contains a description of the lake whitefish of the Great Lakes region, its life history, a brief account of the early whitefish fishery, and the early attempts at artificial propagation. In discussing the decline of the whitefish fishery, the author states that "Since the last peak of production was 1948, when Michigan fishermen produced nearly 8,000,000 pounds, the catch of whitefish has gone down progressively and alarmingly, reaching an all-time low of slightly over a quarter million pounds in 1957, nearly all from Lake Superior. The cause this time is undoubtedly the sea lamprey. Whether

this predator can be controlled to permit this wonderful fish to reestablish itself in the Great Lakes is a question only the future can answer."

WISCONSIN:

Wisconsin Conservation Bulletin, vol. 23, no. 6, June 1958, 31 pp., illus., printed. Wisconsin Conservation Department, State Office Bldg., Madison 1, Wis. Contains, among others, the following articles: "Improvements in Carp Fishing," by Lewellyn I. Peterson; and "What's New in Fish Management," by C. W. Threinen.

ZOOPLANKTON:

Zooplankton of East Australian Waters, 1945-1954, by Patricia Kott, Commonwealth Scientific and Industrial Research Organization, Division of Fisheries and Oceanography Report 14, 36 pp., illus., processed. Marine Biological Laboratory, Cronulla, Sydney, Australia, 1957.



WHALES DAMAGE SUBMARINE CABLES

Records of various cable companies show that at least 14 cases of damage to submarine cables caused by whales have been reported. Ten of them were off the Pacific coast of Central and South America, one was near Newfoundland, two off the Atlantic coast of South America, and one off the west coast of India. In six of the cases, the whales became entangled with the cables at a depth of about 500 fathoms, with 620 fathoms the maximum depth reported. All the whales identified were sperm whales; the cable was generally wrapped around the jaw and sometimes around the flukes and fins. (Trade News, December 1957, of Canada's Department of Fisheries.)

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CONTENTS (CONTINUED)

FOREIGN (Contd.):	Page	FOREIGN (Contd.)	Page
International (Contd.)		Libya:	
United States-Cuba Convention for Conservation of		Export Duty on Sponges Increased	65
Gulf of Mexico Shrimp Resources Signed	44	Tripolitania's Tuna Season Disappointing	66
Whaling:		Mexico:	
Agreement Reached on Number of Catcher Boats		Ensenada Fishery Products Production, 1957.	66
for 1958/59 Antarctic Season	45	Merida Shrimp Fishery Trends, April-June 1958	66
Tenth Annual Meeting of International Whaling		Netherlands:	
Commission	45	Electric Cable for Ticker Chain Used by	
Angola:		Trawler Owners	66
Fishing Industry, 1957.	47	Exports of Salted Herring to Israel to be Increased	67
Plans for Reorganization of Fishing Industry	48	Imports of Japanese Canned Salmon Decreased	
Argentina Republic:		First Six Months of 1958	67
Fishing Seasons for Important Species	48	Shrimp and Herring Fisheries Trends	67
Bahama Islands:		Nicaragua:	
Fisheries Trends	48	Shrimp Fishery Being Developed	67
Belgium:		Norway:	
Reaction to Iceland's Decision to Extend Fishing		Balance of Antarctic Whale-Oil Stocks Sold	68
Limits	48	Bulk-Stored Fish Meal Tests Successful	68
British Guiana:		Canned Fish Trends, July 1958	69
Exploratory Shrimp Fishing off British Guiana	49	Position on Expansion of Territorial Fishing Limits	
Colombia:		Peru:	
Basic Fishing Regulations Implemented	49	Fisheries Trends	69
Cuba:		Portugal:	
Closed Seasons on Lane Snapper, Muttonfish, and		Canned Fish Exports, Jan.-May 1958	70
Sponges Terminated	50	Canned Fish Pack, January-March 1958	70
Denmark:		Fisheries Trends, May 1958	70
Fishermen Protest 12-Mile Fishing Limits	50	Spain:	
Loans for Faroese Fishing Fleet	51	Vigo Fisheries Trends, June 1958	70
France:		Surinam:	
Tuna Canning and Tuna Fishing Controversy	51	Shrimp Fishery Trends, June 1958	71
Honduras:		Uganda:	
New Fishing Regulations Issued	51	Fishery Developments Reported by FAO Expert	71
Iceland:		Union of South Africa:	
Decision to Extend Fishing Limits Reaffirmed	52	Pilchard-Maasbanker Industry, January-April 1958.	72
Fisheries Trends, 1957	52	Whaling Production	73
Fish Freezing and Processing Capacity Increased	52	U. S. S. R.:	
Israel:		Iceland's Territorial Waters Fishing Limits Extension Supported	73
Expansion of Fisheries Planned	53	United Kingdom:	
Japan:		Canned Salmon Imports from Canada	74
Analysis of Fishing Industry	53	Government's Views on Faroese Fishing Limits	74
Exports of Tuna Loin and Discs to United States		Iceland's 12-Mile Fishing Limit Opposed	74
May Resume	55	Lobster Pot Developed with Folding Steel Frame	74
Canned Tuna in Agar Jelly	56	New Fish-Smoking Machine Developed	75
North Pacific Mothership Salmon Fishing as of		Subsidies for Whitefish and Herring Industries	75
August 10, 1958	56	Venezuela:	
Exports of Selected Fishery Products to the United		Canned Sardine Exports to Mexico Under Consideration	75
States, January-April 1958	57	FEDERAL ACTIONS:	
Summer Albacore Catch Unexpectedly Small	57	Federal Trade Commission:	
Salmon Fishing in North Pacific by Mothership		Consent Order Approved Prohibiting Illegal Brokerage by Sea Food Packer and Its Subsidiary	76
for 1958 Completed	57	Department of the Interior:	
Estimated Salmon Pack and Exports for 1958	58	Agreement with Alabama on Protection of Aquatic Life During Gulf of Mexico Exploratory Oil Operations	76
Canned Salmon Trends	59	Department of State:	
Fisheries Loans Activities, April-June 1958	59	Renegotiations Under the Gatt with Several Countries	
Interim Report on Fish Meal Factoryship Operations in the Bering Sea	60	Eighty-Fifth Congress (Second Session).	77
Fishery Agency Requests Twofold Increase in 1958		FISHERY INDICATORS:	
Budget	61	Chart 1 - Fishery Landings for Selected States	79
Fishing Industry to Adopt Metric System and		Chart 2 - Landings for Selected Fisheries	80
Standardize Fish Boxes	61	Chart 3 - Cold-Storage Holdings and Freezings of Fishery Products	81
Fish Meal Factoryship Operations in the Bering		Chart 4 - Receipts and Cold-Storage Holdings of Fishery Products at Principal Distribution Centers	82
Sea	62	Chart 5 - Fish Meal and Oil Production--U. S. and Alaska	82
Foreign Fisheries Developments	62	Chart 6 - Canned Packs of Selected Fishery Products	
King Crab Cannery Ship Completes 1958 Season in the Bering Sea	63	Chart 7 - U. S. Fishery Products Imports	84
Foreign Trade in Marine Oils, 1956-57	63	RECENT FISHERY PUBLICATIONS:	
Scallop Production	64	Fish and Wildlife Publications	85
Some New Developments in Fishing Vessel Construction	64	Miscellaneous Publications	86
Tuna Boat Owners' Federation Reveals Plan for Base in Thailand	65		
Kenya:			
Japanese Tuna Fishing off East Africa	65		
Lebanon:			
Import Duty on Fishing Nets, Etc., Amended	65		



OPERATION OF NORTH ATLANTIC TYPE OTTER TRAWL GEAR

Fishery Leaflet No. 445 (Operation of North Atlantic Otter Trawl Gear) describes and illustrates in detail the method of side-trawl fishing. The basic principles of operation apply to any size net or vessel since the weight of the otter doors has no effect on the basic procedure. Each step is given in the procedure of setting the net, "shooting" the trawl, hauling the net, and landing the catch. The leaflet is intended for those unfamiliar with the side-trawl fishing method. Excellent detailed drawings further explain the method. This leaflet is a follow-up to FL 437 (Assembly Methods for Otter-Trawl Nets). The leaflet also contains a list of available publications on fishing gear.

Efficient and profitable operation of any fishing gear depends as much upon experience and teamwork of the captain and fishermen as it does upon any other factor. This is particularly true in the case of the otter trawl, since its use and operation frequently varies in accordance with the weather and other changing conditions on the vessel while on the fishing grounds. If certain basic steps are followed, however, valuable fishing time can be saved, and the energies of the crew can be directed toward profitable fishing rather than time-consuming net mending and clearing of snarls.

Otter trawlers fishing off the Atlantic coast use the side-trawl method primarily, and the vessels in that area are classed according to tonnages as listed below:

Size of Trawler	Tonnage	Approximate Capacity for Iced Fish	Number in Crew
	Gross Tons	Lbs.	
Small	To 50	10,000- 50,000	2 to 5
Medium	51 to 150	50,000-100,000	6 to 8
Medium	51 to 150	100,000-180,000	11 to 15
Large	151 and up	180,000-500,000	15 to 18

The typical large modern otter trawler using this side-trawl type of gear is designed for operation by six keymen per shift; each keyman is stationed at one of the six predetermined key positions when setting or hauling in the net.

Free copies of FL 445 may be obtained from the Division of Information, U. S. Fish and Wildlife Service, Washington 25, D. C.



Fig. 1 - Hauling net. Note vessel and net position with respect to wind direction.

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